University of Alberta

ENVIRONMENTAL AWARENESS, ATTITUDE, AND ACTION IN A NORTHERN THAI VILLAGE

Jeji Varghese ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Masters of Science

in

Rural Sociology

Department of Rural Economy

Edmonton, Alberta

Fall 1997

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Degree: Master of Science

Year this Degree Granted: 1997

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ABSTRACT

Consideration of how to create and maintain sustainable communities is a current trend. This focus exists both in the North and with respect to the poor in the South. However, there is a gap in the knowledge base for the increasing number of middle class rural communities in rapidly industrializing nations. These communities have ties to the land, yet in many ways the opportunity to consume more material goods makes the impact that they have on the earth emulate more the North than the South. Their unique position provides these communities with a window of opportunity to choose how they want to redefine sustainability within their own dynamic context.

This research was conducted over four months in the village of Ku Daeng in Northern Thailand. It was made possible through a CIDA funded institutional linkage between the University of Alberta and Maejo University, entitled: *Human Resource Development for Sustainable Agroforestry and Environmental Conservation in Northern Thailand.* The goal of this study was to examine the environmental education needs of women in a village in Northern Thailand, by assessing both the process and content concerns within an environmental education framework. Environmental education content included consideration of environmental *awareness, attitude* and *action.* A variety of research methods, within primarily a qualitative approach were selected as the most meaningful approach for a study of this nature.

The study showed that these women were limited from the process of environmental education in different ways: such as limited opportunity and time constraints due to gender

roles. In addition, there are constraints due to social norms which are in the process of transition due to fast economic and social development of the village as a whole. The women were aware of local environmental issues and were vocal about suggesting ways in which they could be overcome. Issues that were of key importance to the women included water and waste disposal concerns. The women felt that the best way of providing environmental education to solve these issues would allow them to work collectively, learn effectively and accommodate constraints such as time.

One assumption that often goes unchallenged is that children transfer environmental *awareness, attitude,* and *action* to their families. Within this particular village, the lack of this transference was another key finding of this study.

ACKNOWLEDGMENTS

The environment teaches us many things,
One of which is that all things are connected.
Everything depends upon the other.
This end product called the thesis,
Too is the same
In that it is dependent upon the
Cumulative efforts and support of many.

Dr. Murray, my *gypsy* supervisor, you've been my mentor, my guide and my inspiration. Dr. Gill, you had the foresight to suggest Ku Daeng. You've also been very helpful with administrative details and your editorial suggestions. Dr. Butler, you inspired me to do something that will "make a difference for the earth". Dr. Krogman, you provided feedback beyond your call of duty.

CIDA (and thus all Canadians) supported a project that gives students to opportunity to make a contribution through research. Ajan Numchai and Ajan Sunila, you were both instrumental in securing Ku Daeng as my study setting, and provided guidance with my research during my stay in Thailand. P'Chi, Blues and Thong (my student field assistants) you allowed me to get beyond the language barrier. All the staff and students I encountered at Maejo University and at the University of Alberta; you assisted by being so willing to find ways to make my life a little easier. Ajan Songvut you found so many ways in which to assist while I was in Thailand. Kuhn Diana-you always bailed me out of awkward situations, you're so caring and helpful. Ajan Wilawan, you believed in me and kindly offered assistance when you could.

Khru Panee, you welcomed me (and my family) into your home and providing more support than I could have ever dreamed of. Mae On, you taught me that the "language of gestures" could break any language barrier. The villagers of Ku Daeng; you each extended hospitality during my stay there and showered me with unconditional patience.

Have no fear, I would not conclude without acknowledging the support of my family (Mom, Dad, Jeju and Joji), extended family and friends (including Rural Economy). You've been my support network. You put up with me and my constantly changing deadlines and have aided in the completion of my thesis each in your own way (and yes, Joj I recall your assistance with coding). Special mentions also go out to:

Regi-*for being you,*
Orysia -*for helpful advice,*
Quinn-*for caring,*
Joanne-*for listening,*
Yasmin-*for sharing,*
Treena-*for willing to help.*

God, for always being with me (in whichever country I may be in) and for blessing me with such a wide array of people to inspire and assist with a gentleness of spirit and genuine outpouring from the heart.

Travelling to a different country can be both exhilarating and frightening.
Thanks to the wonderful people I had a pleasure to meet during my stay in Thailand, I am happy to say that my travels consisted of the former, rather than the latter. Images to remember include: Humour! Mai pehn rai ka! Thai Smile and Thai Hospitality

In the Spirit of Conservation and of Environmental Education,
I appreciate all the efforts and love shown through your actions☺

Kop Kuhn Mark Ka!

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Chapter 1

1. Introduction

1.1 Purpose of Study

The purpose of this study was to explore the attitudes of northern Thai women and their children, and the relationships of these views with environmental concerns and their access to educational programs. With growing environmental pressures, the need for an ecologically literate citizenship is more pressing. One group that is often overlooked in these discussions on ensuring an ecologically literate citizenry is rural women. This study was an attempt to amend this oversight.

1.2 Background of Study

The background of this study will be presented through three key questions: (1) why focus on environmental education, (2) why focus on women, and (3) why focus on children.

1.2.1 Why Focus on Environmental Education?

There is a growing body of research appearing in the literature examining environmental concerns. This focus on the environment has stemmed from a growing awareness of the limitations in the ability of the earth to sustain itself amid the rapid change introduced by humans. Over the years there have been different frameworks proposed to understand the relationship between humans and nature. There is a distinct set of policies and programs that reflect each view. Field & Birch (1988) described three such frameworks within rural sociology as:

1) Humans have dominion over nature, where the focus is on controlling or taming nature: examples of this would be the attempts to settle and harness the land for food and fiber. This is a very anthropocentric viewpoint.

2) Humans viewed within nature, which is more biocentric in viewpoint: here there is a recognition of the limits of nature and the role of non-human variables.

3) View of nature as a partner, is also biocentric, however it is more of a combination of the above two frameworks: there is a recognition that humans

> have the ability to manipulate environments, but there is also the acknowledgement that there are ethical limits to this manipulation, in addition to a responsibility to both natural environment and social environments. The management strategy focus in this view is cooperative rather than competitive.

There have been many attempts to examine the causes of environmental problems. The demands of an increasing population, the overuse of resources by the North, and ignorance of the impact of our actions on the earth are but a few. From the third framework above emerges the need for an environmental ethic. Some may look to the Brundtland Report (World Commission on Environment and Development, 1987) for the definition of the term "Sustainable Development" as the answer. In this report sustainable development was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987:43). However, there are critics who state that this terminology is problematic, vague, and open to much interpretation. One interpretation is that the term encourages the status quo.

Perhaps, what is needed is a more grassroots and holistic approach to defining an environmental ethic; however, this would mean that a larger proportion of the population needs to be versed in the concepts and principles of environmental issues than is currently the case. A significant number of individuals, corporations, and governments who have the interest, motivation, and background to take on this task would be essential. This study however concentrates on individuals. But why is an environmental ethic needed? The existence of an increasing number of environmental issues leads one to believe that currently there is not a wide-spread environmental ethic. Then the question becomes, where does one find such a sense of responsibility and how can one acquire it?

One potential source for acquiring an environmental ethic is broad-based environmental education, not restricted to children. The outcomes of such environmental education exposure within a community could be four-fold: 1) an awakening of fresh insightful alternatives 2) an expansion in knowledge, 3) a shift in attitude, and 4) a change in behaviour. This approach might provide one solution to decreasing the negative impact of humans on the earth, by increasing their awareness of their impact, and providing the tools to make conscientious alternative decisions.

The assumption being made in proposing an educational approach is that an environmental ethic is not innate, but can be learned, and transferred to others. The outcomes of environmental education cannot be achieved in isolation from issues such as having the economic means and the power to act on those decisions. However, it also means that neither economics nor power, alone or in combination, can provide the incentive and know-how to create sustainable communities. Environmental education can fulfill this role.

Various authors point to specific areas as the cause of environmental degradation, which are often based on political ideology (Gaard, 1993). There are the Eco-Marxists who see the problem as capitalism and the eco-socialists' who deem the issue as individualism. "Greens" point their fingers at capitalism, while deep ecologists condemn anthropocentrism. The social ecologists define the problem as 'hierarchy' and the ecofeminists as a power paradigm based on androcentrism. Each of these perspectives provides us with their corresponding solutions and desired ends. However, the actual causes of environmental degradation may actually be a combination of all these things, and the specific causes may also vary depending upon the locale (Leach, Joekes, & Green, 1995).

For example, Mira and Vandana Shiva (Shiva & Shiva, 1993) have stated that economic insecurity is the root cause of environmental problems and that by giving people the rights and access to resources, so that they can generate sustainable livelihoods, would be the only solution to environmental destruction and the population growth which accompanies it. I would argue however, that history has shown that humans are not necessarily environmentally responsible by nature; it is a level of awareness that can be learned, and while economic insecurity is one factor, it is not the only factor.

One of the problems that plagues the development process is the attempt on the part of governments and development organizations to make giant leaps and expect that everyone can keep up. Rather, it might be more effective to start with the small steps which cumulatively can become giant leaps. There are different scales by which environmental issues can be examined. In addressing large scale issues, local grassroots initiatives should not be overlooked. Grassroots actions tend to produce a 'multiplier effect', by setting off a series of other positive actions and building a base from which larger initiatives can be implemented (Davidson, 1993). This is why environmental conscientisation on a grass roots level is important.

Thus, to lead sustainable lives and to lessen our impact on the environment, we must deal with these interdependent, yet different aspects of awareness, economic means and power. There are many different underlying reasons for the destruction of the environment, and as noted above the reasons may vary depending upon locale. Though it is important to determine the causes and deal with them, it is also important to ensure that the individuals and groups have an understanding and appreciation of the natural environment.

There have been criticisms that because the poor do not have the economic means or power base, that environmental education is inappropriate. This is then interpreted to mean that they have limited alternatives for action and limited power to act. This view often leads to a focus on income generation or agricultural development in isolation of the environment and the creation or recognition of an existing environmental ethic. Thus, more is lost than gained. Unless the quality of the environment is considered simultaneously with other initiatives, the need to live in a sustainable manner will not be considered. David Orr (1994) discusses the need for a biophilia revolution. He defines this as a combination of an efficiency revolution (one of technology and economics) and sufficiency revolution (one of morality and human purpose). He further states that two barriers that prevent this from occurring are denial and imagination. He also advocates the need for conscious attention to designing our futures. He states, "Where good design becomes part of the social fabric at all levels, unanticipated positive effects (synergies) multiply. When people fail to design carefully, lovingly, and competently, unwanted side effects and disasters multiply" (Orr, 1994:105).

1.2.2 Why Focus on Women?

Consideration of the links between the environment and women is a recent entrant to development and development policy. However, this connection is limited, as women tend to be the last considered, the lowest funded, and the first cut in times of economic resource constraints (Brown, 1991), even though they are the foundations of the "social economy". Women's contributions to community are often overlooked by program developers, therefore gender issues are often overlooked (Gabriel, 1990).

Too often development programs have relied on the trickle down theory to reach the needs of women and children, however the literature suggests these programs have been largely unsuccessful (for examples refer to: Kurien, 1985; Livingston & Holt, 1987; Shiva, 1988; Gladwin, 1993; Kaul, 1993; Woolfrey & Benoit, 1993; Leach et al., 1995). A more balanced approach is now needed. However, creating programs solely focusing on women as a generic category is not the solution. It is important to recognise that women are a heterogeneous group, they are not a unified category for which monolithic programs can be developed. There are differences in terms of culture, ethnicity, class, age, marital position, and socio-economics (Agarwal, 1992; Leach et al., 1995). Furthermore, they live within the context of their families and communities.

Gender issues with relation to the environment can be strongly related to development, so when addressing specific environmental issues, one must determine if gender is a factor in the situation. There are many different approaches to conduct research (Eichler, 1991). Some research may be people-centered, others male-centered or female-centered, depending on the subject being studied. Too often what has been defined as people-centered, has been merely male-centered in disguise. When one does not know about women, adding this perspective can alter the knowledge one has about men. The Declaration of Women at Rio called for a commitment to fundamental changes in the world order; replacing male views with female ones (Antrobus, Bizot, & Deshsingkan, 1994). I would prefer a recognition of the values of all views, rather than the pitting of one against the other. For this to be the case, these views must be known. This thesis was designed to document women's and children's views.

1.2.2.1 Why Environmental Education for Women in Ku Daeng

"[P]roecologically acting people are still in the minority" (Vitouch, 1993:344), meaning that the goal of creating sustainable societies are still far off. Developing countries were at one time known for their ability to be resourceful, however, as globalization increases the availability of many commodities, consumption in the South becomes as readily apparent as consumption in the North. Thus resourcefulness was initially a consequence of economic incentives (Cherif, 1995). But does scarcity need to be the incentive for efficient use of resources? Perhaps this is where an environmental ethic might fill the gap in our conceptualization. Bowers (1995:180) asserts that "[g]rowth in our ability to more rapidly deplete the pool of ecosystem energy must be replaced by growth in the symbolic areas of culture that enrich human understanding, meaning, and the participatory dimensions of communal life ."

Environmental education at both formal and non-formal levels is considered one of the basic requirements for any nation's integrated effort to tackle its environmental problems (Chou & Roth, 1995). The development of environmental education in specific countries requires both the development and teaching of environmental philosophy and related concepts at every point in the formal and non-formal education process (Schmieder, 1977) (Chou & Roth, 1995). In developing countries there is a growing appreciation for the need to package environmental education as "environmental management, with practical skills being taught to ensure its use" (Tudor, 1990-1991:12).

As women in rural areas are integral parts of the agricultural system in developing nations they need to be identified as a "vital group to target and influence" (Tudor, 1990-1991). Sopchokchai (1995) writes about Thai rural women that:

> *[w]ith limited knowledge about operating agricultural machinery and the proper use of chemical fertilizers and pesticides, women are at high risk of several health hazards including harmful chemical usage, accidents, mental tension and a host of animal-borne diseases.* *(p. 3)*

This example suggests the need to consider rural Thai women because of their ties to the agricultural system. Thus growing consumerism at a village level, the role of environmental education at a national level, and the unique experiences of rural Thai women developed through their agricultural links and their gender roles are reasons to focus on rural Thai women.

1.2.3 Why Focus on Children?

There is a two-fold reason for documenting the views of children. The first is that it will lead to an understanding of their awareness of environmental issues. This information can then be used to design educational programs. The second is to gain an appreciation of the role children play, as sources of environmental education for their families, as well as the possible implications for action as these children become adults.

1.2.4 Objectives

There were three main objectives of this study. They were:

1. To gain an understanding of local environmental concerns through an analysis of the attitudes and knowledge of northern Thai women and children.

2. To apply gender analysis to explore if gender roles act as barriers to environmental education for rural northern Thai women.

3. To make recommendations about alternative methods of environmental education that would meet women's needs for environmental ***awareness, attitude, and action*** (AAA).

1.2.5 Rationale and Significance

In nations, such as Thailand, where a large portion of the population is involved in agriculture, environmental factors have a high degree of relevance to women's daily roles. Women's roles in agriculture and in child-rearing make them an important audience. In addition, since there have been a large number of studies on men and relatively few on women, this indicates there is an information gap in the literature that needs to be filled.

Often research has focused on the west or on the poor. Another information gap which this study fills is the one related to the growing middle class rural population that has emerged from the recent economic success of Thailand. This group is in a unique position, with increased consumerism and increased amount of leisure time, yet a strong connection to agricultural systems. By assessing this particular populations' views on local environmental concerns, their environmental education needs can be better met in the future.

Understanding the need for and the best ways of disseminating important environmental information becomes vital for ensuring that solutions to environmental problems are effectively addressed. By understanding Thai women's views and how their environmental education needs may be met, including recognition of their labour demands which may constrain participation, the hope is that educational agencies may also benefit from the knowledge gained. Addressing children's views and work responsibilities allows consideration of both present and future environmental education needs. Thus the findings of this study have uses for building both extension programs and elementary education programs.

1.3 Outline of Thesis

This study is organized into five chapters. The first chapter provides the background, objectives and rational. Chapter two begins by describing some of the critical environmental issues in the larger Thai context. It then provides an overview of environmental education literature and raises some methodological issues. In addition, there is a brief summary of the key guiding concepts for the study. This information sets the stage for the methods chapter. Chapter three describes the research methods used and outlines the limitations and assumptions of the research process. Chapter four begins by providing a description of the study area and the participants of the study. This is followed by the results of the analysis of the data. Chapter five contains both a discussion of the data presented in chapter four and the recommendations for meeting the women's environmental education needs.

2. Literature Review

This study was designed to examine the environmental knowledge and attitudes of northern Thai women and children in order to make recommendations about related educational programs. Literature focusing on two aspects of the topic are briefly outlined: Thai environmental issues, and environmental education. Thai environmental challenges are included to provide a greater appreciation for the Thai context in which this study was undertaken. Since it is such a critical component of this study, environmental education literature was reviewed to provide a greater appreciation of the complexity of environmental education. Included within the final section is an outline of gender analysis and a brief consideration of some environmental education research methodological issues. The literature reviewed provided the key concepts which guided the study. The end of this chapter will provide a brief summary of those key concepts and how they relate to each other.

2.1 Thai Environmental Challenges

Thailand faces many challenges regarding both the natural and social environment. Problems of deforestation, over-exploitation, soil erosion, overpopulation, AIDS, inequality, fisheries, and pollution, are just a few of these challenges (Kulick & Wilson, 1996; The Siam Society, 1989). Although there are many unique attributes of Thailand, the existence of these issues within the Thai context shows that these attributes have not been translated into fewer environmental issues than other nations.

Certainly deforestation is an issue that many nations are finding themselves forced to deal with. Thailand is not an exception. Thirty years ago, two thirds of Thailand was under forest cover. The forest was able to sustain the population at that time. One generation later, with twice the population, but only half the forest cover left, deforestation is taking its toll. Flooding is on the rise and the damage due to soil erosion is high. For many decades, logging was uncontrolled. Only recently did timber concessions within Thailand begin to be revoked. Some say, however, that this merely leads to a relocation of the forestry depletion to neighbouring countries (Kulick & Wilson, 1996).

Another issue is the growing gap between the rich and the poor. Though, the annual economic growth rate of Thailand has been about 10% (Kulick & Wilson, 1996), there is a discrepancy between how this growth is distributed among the population.

Another issue of concern is the population dynamics. Since, the population growth rate of Thailand has halved from that of the 1970's to 1.5% per year, through the efforts of Senator Mechai Viravaidhya, the president of the Population and Community Development Association (Kulick & Wilson, 1996; Aids Likened to National Disaster, 1996), overpopulation is no longer seen as a challenging issue. In its place however, is the threat of AIDS. Conversations with Thai individuals show that there is a growing fear of a massive loss of the population through AIDS. It was estimated that for 1993, 12% of young Thai men were infected with HIV (Kulick & Wilson, 1996). Currently, 10% of the population is HIV positive (Andresen, 1997). The alarming advancement of AIDS has taken the lives of men, women, and children throughout Thailand. Recent reports suggest that by the year 2000, 86 000 children will be orphaned by AIDS. One in three children are predicted to be HIV positive (Andresen, 1997).

There are also a number of regionalized issues. Urban centres like Bangkok face many issues including that of air pollution from vehicle emissions (Geography: Environment, 1997). Whereas, rural areas are heavily impacted from water pollution from organic and factory waste (Geography: Environment, 1997). Rapid industrial expansion and a high population base means that if left unchecked these issues will only get worse.

Finding solutions for the environmental issues affecting Thailand requires a concerted effort by many. In an attempt to gain a better understanding of the extent of the environmental issues and to gain an appreciation of potential root causes, the Siam Society organized a symposium called "Culture and Environment in Thailand." This symposium identified cultural reasons for the problems in hopes that exposure would help people face the growing challenges. Some of the participants embraced the idea that the culture and environment were one. Others felt that there was a relationship between the two, and that this relationship was out of balance (Kunstadter, 1989). Some felt that the strength of Buddhism has the ability to overcome these challenges. There are others however, who felt that so far this has not been the case because "modern Buddhism appears to be a giant opportunity that is fast asleep. The truly relevant teachings are not applied in meaningful ways to our environmental problems..." (Brockelman, 1989:491). This implies that Buddhism has the potential to help alleviate the growing problems, but that it first needs to be more effectively used tapped.

Having not been colonized, many claim that the Thai are in a unique position to address their environmental challenges, as they have no external forces to lay the blame on. They are in a unique position to learn from their past (Kulick & Wilson, 1996). The various types of environmental challenges pressing Thailand and the concerted effort required by many to solve these challenges makes the case for people at both an individual and collective level to be versed in the concepts and principles of environmental issues.

2.2 Environmental Education:

The environmental crisis is not:

> *first and foremost one of technology...it is one within the minds that develop and use the technology [one that] reflects the prior disorder in the thought, perception, imagination, intellectual priorities and loyalties inherent in the industrial mind...[T]he ecological crisis has to do with how we think and with the institutions that purport to shape and refine the capacity to think...[I]n other words it is a crisis of education, not one in education: tinkering won't do.* *(Orr, 1996:7)*

If environmental education is one response to the environmental situation, then it must in some way alleviate environmental issues by addressing them directly, or at least by bringing us closer to this goal. However, as Gigliotti, (1990) correctly points out, education is not the only solution to prevent and fix environmental challenges, it is one of many, after all "no single answer will likely be the sole solution-the task is too complex" (p. 11).

This section 1) defines environmental education, 2) defines women's environmental education needs, 3) discusses barriers to environmental education using a gender analysis framework, 4) briefly overviews some environmental education research issues, 5) discusses access to environmental education via alternatives and 6) considers environmental education within development.

2.2.1 Defining Environmental Education

Considering the complexity of environmental issues and the means of addressing them, it makes sense that environmental education has developed in different ways and drawn from different educational frameworks to achieve a range of goals. However, essentially, the ultimate goal to create environmentally responsible citizens with the tools to make proecological decisions in order to establish and maintain sustainable societies, is fairly consistent. Yet, since people view (both define and operationalize) the environment and the environmental crisis in different ways, it makes sense that environmental education itself is defined differently by various people.

The following is one general definition of environmental education which stems from a broad definition of environment. When the environment is defined as all-encompassing and environmental issues include social, physical, economic and ecological domains, the purpose of environmental education becomes to improve the quality of life for all (Lewis & James, 1995; Disinger, 1986).

The research literature reviewed for this study reveals opposing views on who the target for education is, what environmental education is, what its goals are and how it is to be achieved. Traditionally, environmental education has been viewed in terms of children as the primary target. The literature and research undertaken in environmental education certainly reflects this (Sutherland & Ham, 1992). The growing concern with environmental issues is making some educators question the assumptions made in having children as the primary target.

> *Environmental education planning that favors programs for children over programs for adults either ignores the need for rapid changes in environmental behavior or makes the untested assumption that children are a key audience to influence other sectors of society*
>
> *(Sutherland & Ham, 1992:10).*

There is push towards multiple targets, including to an adult audience (Vitouch, 1993; UNESCO-UNEP, 1991). This study is based upon environmental education targeted at such an extended audience, including adults, particularly rural women.

There are many views on what environmental education should entail. Reviewing the literature also reveals that these views are often based on different assumptions. These assumptions include who is considered responsible for causes of the environmental crisis and who should be responsible for a solution. One of the main difficulties in assessing cause and effect, is that the benefits of environmental depeltion often go to the individual, whereas the harm is shared by the group. For example, when one individual pollutes the water for economic gain, the profit goes to the individual, yet the toxic water is shared by the entire community. Some specify an individualist focus with an ideal of personal responsibility (Gigliotti, 1990); others a collective focus, supporting an ideal of social responsibility (Vitouch, 1993; Robottom & Hart, 1995). Individual responsibility stems from a belief that environmental problems stem from individuals and thus individuals must work to solve them. One problem that Robottom & Hart (1995) raise about an individualistic ideology is that one ends up putting all the blame on what one considers the victim. They state that then there is a failure to address the social, historical, and political factors that mitigate against changes in behaviour. Thus, collective or cultural responsibility stems from the belief that the problems are inherent in the system and thus wider systemic changes must occur to alleviate the environmental crisis. Proponents of this second approach include Bowers (1996) who advocates a culturally centered approach, not merely an individually centered one. His approach is termed the 'cultural/bioconservative' approach to ecological literacy, whereby one

> *conserves and renews cultural patterns that minimize the adverse impacts on natural systems... [I]t is not a form that maintains the privileges of certain groups or conserves traditions out of nostalgia for the past...[Thus,] all forms of communication essential to sustaining cultural patterns are part of the process of environmental education...[where ecological literacy includes] ...an awareness of how the assumptions, values, technologies, and categories of thinking of a culture influence how humans relate to the environment*
>
> *(Bowers, 1996:8).*

What both of these approaches fail to address is the complexity of the environmental crisis. Some aspects are caused by individuals, others by the system, and yet other aspects, by the interaction between the two. Thus, any approach to environmental education would need to consider that both focuses have something to contribute. In addition, though some aspects may be caused by either the individual or the system, in isolation or together, solutions often require either one, or both, regardless of what the initial cause was.

The third point of contention in the literature is how to achieve the ultimate goal of environmental education. For the most part, this difference is also tied to the different outcomes that are felt to be the operationalization of the ultimate goal. The question becomes what are the tools? For some it is *awareness*, *attitude* and *action*; for others it is critical thinking.

In their model of environmental consciousness, Langeheine and Lehamnn (as cited in Vitouch, 1993), claim environmental knowledge (awareness), environmental attitudes and environmental acting are the key essential determinants. Environmental *awareness, attitude and action* (AAA) are expressed using different terminology within the literature (refer to Table 2-1), yet the essence remains the same.

Table 2-1

Terms Used in the Literature for Environmental Awareness, Attitude and Action

Simile:	Awareness	Attitude	Action
KAP:	• knowledge • cognitive • knowing	• attitude • affective • feeling	• practice • change in behaviour • doing • environmentally responsible behaviour (ERB) • environmentally friendly behaviour • proecological behaviour
Definitions/ Components:	• depth of awareness • accuracy of knowledge • expand knowledge of issues, values, action strategies, and barriers	• motivation • environmental ethic • shift in world view to either human and nature or humans as partners with nature • social norms • locus of control • personal and collective responsibility	• barriers • lack of tools (i.e. resources, time, $) • skills base

The use of these three terms in this study are meant to capture the meaning of a combination of the terms used within the literature. *Awareness* is used to include the following: knowledge of issues, knowledge of different valuation systems, knowledge of the various action strategies and skills associated with solving environmental challenges. *Attitude* refers to the affective domain, including sensitivity of 'humans within nature' philosophy and a 'humans and nature as partners' philosophy, the creation and maintenance of social norms, the perception of whether one can bring change through their own actions (locus of control) and personal and collective responsibility; which entails an obligation and a sense of duty to carry out an action (Boerschig & De Young, 1993). *Action* is also known as practice. Discussion of *action* includes having a skills base to initiate and sustain an action and consideration of barriers to acting, which can include a lack of resources.

Much of environmental education research focuses on one or two aspects of environmental AAA. Very few focus on the integrated nature of all three (Vitouch, 1993). Research topics include assessment of which of the three aspects are most important, and how to increase *awareness* or *attitude* more effectively. The focus on *action* is also substantial. Within the literature, *action* is referred to as "environmentally responsible behaviour," "environmentally friendly behaviour," or "proecological behaviour (Vitouch, 1993)."

Reasons given to explain why environmentally responsible behaviour has not been achieved include both content and process aspects of environmental education. In terms of content, Volk, Hungerford, and Tomera (1984) have suggested that most formal, informal and non-formal environmental education methodologies are not designed with the goals of environmentally responsible behaviour in mind. Another reason given is the personal focus. "[E]nvironmental education has produced...citizens...armed with ecological myths...but [lacking] the knowledge and conviction of their own in the environmental problems" (Gigliotti, 1990:9). This suggests that there must be a linkage between AAA on a personal level. In terms of process, reasons given include: a lack of awareness by environmental educators of the variables that promote of environmentally responsible behaviour. One example would be the need for environmental educators to model environmentally responsible behaviour (Smith-Sebasto, 1995). Orr (1994) would go a step further stating that all societal institutions need to reflect and promote this type of behaviour. For example, educational institutes and programs need to be internally sustainable before or along with promoting sustainability among their students.

Critical thinking[1], as an outcome of environmental education, in many ways is a reaction to the focus on *action*. Though in itself it could also be defined as a key aspect in the integration of the three components. However, proponents of the critical thinking outcome fear that the social change objectives of environmental education, as described by Fien & Rawling (1996), fall short of the goals of education. Thus, the debate between these two approaches (environmental AAA and critical thinking) can be partially explained by the ongoing battle between environmental education and education, as to whether they have the same or different processes and outcomes. Individuals such as Orr (1992) and Robottom and Hart (1995) seem to make the case for there being similarities between the two, whereas Fien & Rawling (1996) indicate that there are differences. I think however, that the thread of critical thinking weaves through all these debates. Rather than competing for each other's time, energy and space within the research, a better approach would be to conceptualize ways of integrating what has been learned through educational research to that of environmental education research, understanding that there may be some differences, and that critical thinking is a key thread running through all environmental AAA research.

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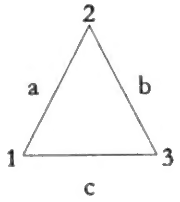
[1] Critical thinking provides a "critical perspective on the business as usual approach to development and the social values and structures that support it" (Fien and Rawling, 1996:12).

Linkages between the three A's are important. When looking at environmental education, one must look at three components and the interactions between them:

EE= 1+2+3 where;

- 1=Awareness (knowledge, depth, accuracy, cognitive)
- 2=Attitude (affective, motivation/environmental ethic, view of human-nature relationship)
- 3=Action (link b/n 1 & 2 to result in ERB, interplay of barriers, i.e. resources, like time and money)



- a=1+2=without action is meaningless does not equal sustainable lifestyle
- b=2+3=without knowledge of what to do, action can be easily misguided
- c=1+3=eventually stop action as no feeling nor passion to sustain, thus does not equate with a sustainable lifestyle

Experience has shown that any one or even combination of two of ***awareness, attitude and action*** is insufficient. For example, research by Braun et al. (1987) has shown that "knowledge is a necessary but insufficient instrument of change" (in Boerschig & De Young, 1993:18). Simmons & Widmar (1990) show that conflicting attitudes can also form a barrier to action. An example of a, in the diagram above, is that a lack of personal salience and efficacy can form barriers even for someone with a high sense of responsible action or a high level of conservation ethics (Simmons & Widmar, 1990). An example of b, shown through research is that "a lack of knowledge does form a barrier even among those endorsing responsible action…*or*…who hold a strong conservation ethic" (Simmons & Widmar, 1990:16).

Within research the need to focus on the individual components, can be justified, but in the process, we must not lose sight that they all are essential to achieve ultimate goal. Perhaps it is more important to accept the differences as such, and recognize that "there are many pathways to reaching the ultimate goal…[and]…be tolerant of alternative approaches" (John Sibly as cited in Tudor, 1990-1991). Though a case here is made for the legitimization of alternative perspectives, a specific case could be made for any one component or set of interactions between components, depending upon the needs of one's audiences.

2.2.2 Defining Women's Environmental Education Needs

Bandara (1989) lists poor women as one of the targets to which environmental awareness must be promoted. This is often achieved through the uses of formal and non-formal educational strategies and mass media. For many rural women, their responsibilities and gender roles often prevent them from being able to take an active part in formal educational programs (Rani & Reddy, 1989). Household and non-household work foregone becomes a barrier to women's educational participation. Thus, research points out the need for educational programs that are accessible to all women, especially those unable to forsake their gendered responsibilities. It is because of this that non-formal education is used as an alternate means of uplifting their status and improving their awareness of various issues. A bottom-up approach is important for environmental education programming, environmental-economy linkages research, as well as, pilot projects, involving *action* at the local level and environmental management initiatives (Davidson, 1993).

Women in southern nations are often the primary producers of food for their families, when compared to women in northern nations. In addition, women who live in rural areas are often more connected to the land due to either their dependence on, or use of agricultural systems. Their fuel gathering tasks link them to the forest and as water carriers they are intimately tied to aquatic resources. Thus, environmental degradation has large negative consequences for them. It does not make sense for a woman in such a position to want, for example, a rampant destruction of trees, because, as local trees are cut, she will need to trek larger distances to fetch firewood (Kaul, 1993). It is therefore critical that we view these women as knowledgeable, environmental decision-makers, with an important role in defining sustainable development (Kettel, 1991).

Although many women are the primary users of natural resources for human subsistence, to date relatively little research has been done on women's use and management of natural resources. People tend to assume that women only play a role in causing the degradation. In the past, many times development projects have marginalized women (Tinker, 1976; Tiano, 1987). Being left to fend for themselves, many women have become a repository of indigenous knowledge about sustainable resource management. Often, poverty, not ignorance, forces these women to contribute to environmental degradation. This is not to say that ignorance does not play a role for some. Gender and environmental analysis does not suggest that women are better resource managers than men because they are "women", but rather that these women have a background of experience in resource use, management and child nurturing, to address environmental issues in a unique manner (Kettel, 1991).

However, I do not believe, as is often suggested by ecofeminists, that all women are somehow intimately and automatically connected to the environment and thus have some innate knowledge about environmental issues. Today, much of traditional knowledge has been displaced, and though individuals may remember some of the traditions, their understanding of the roots of traditions are often lost. This is especially true when one considers things like migration, changing life styles, and a broadening of potential opportunities, which all impact traditional knowledge. Like men, women too, need to increase their awareness of environmental issues and of traditional and contemporary knowledge in order to be key players in increasing their quality of life and taking part in creating sustainable communities.

2.2.3 Barriers to Environmental Education

There are number of barriers that women face in accessing environmental education, as well as on acting in an environmental manner. There are barriers in terms of labour demands, time constraints, lack of resources, gender roles, and class to name a few.

Gender planning, is a planning approach that takes into account of the fact that "women and men play different roles in the third world society and therefore often have different needs" (Moser, 1989:1799). These needs can be divided into two major categories: strategic and practical. A strategic need is an alternate, more equal organisation of society than present. It is more feminist in nature, and has historically been achieved in a bottom-up struggle of women. Practical needs are based on a human survival need. Thus, they are usually responses to an immediate necessity identified by women within a specific context (Moser, 1989). These may include income earning activities, housing, food, water, or access to land.

The specific needs of women must also be addressed. Women need to have access to appropriate gender-sensitive funding (Gabriel, 1990) to increase their awareness of gender issues and to be trained for more meaningful participation in rural development activities. Intensifying all efforts to raise the consciousness of humanity about the threats posed by continual inaction is important. Lessons from the women's movement that can be applied to the environment include: change is slow and generates resistance, there is never only one right way to respond to social issues, cultures do play a role in this, and that we need a new language as words describe and define, but also convey assumptions, biases, perceptions, and validate reality (Brown, 1991). Our interconnectedness and interdependence with all other species, as well as with nature, should be apparent in this new language (Brown, 1991).

Empowerment involves some concept of self-reliance. Women need to be encouraged to participate at all stages of the rural development process. But to be especially effective, this should start with empowerment of girls (Sohoni, 1992). For example, for transportation solutions, women responsible in the transport task, whether carrying water to homes or produce to the market, must be involved in planning and decision-making.

Rural extension organisations need to consider the actual situations in which women work, and promote awareness and empowerment. Suggestions for empowering include: involving women in decisions which affect their livelihood; giving control over their own time, income, and body; recognizing and valuing the work women do. Women must be aware of their potential and encouraged to exercise their rights; here environmental awareness and education have a vital role to play (Bhardwaj, 1993).

2.2.3.1 Measuring Barriers to Environmental Education through Gender Analysis

"Women hold a high status within Thai society and act more independently in many spheres than women in most other developing societies" (Sopchokchai, 1995:5). Yet, to see how that translates in terms of environmental education, we need to turn to gender analysis.

Gender analysis can be achieved through addressing issues from five different perspectives: welfare, access, conscientisation, participation and control (Longwe, 1991). The following section attempts to look at each of these areas individually, by raising issues within the Thai context and suggesting potential links to the environmental education process.

2.2.3.1.1 Welfare

Welfare concerns can be considered as practical needs. They involve meeting the basic needs of food, shelter, clothing and health..

> *...because of their poverty, most female farmers are engaging in one or more other income-generating activities, such as handicraft production, the processing of agricultural products, and hired laborers in order to earn extra income for the family. These activities add to their working hours on top of their increasing farm duties. Despite their hard work in the fields, farm women, and especially those who are heads of households, are thus coping more heavily with economic hardship* (Sopchokchai 1995:3).

The example above involving female farmers' poverty, could be dissected to cover a number of different areas in terms of causes. Though at the root is the need to fulfill basic human needs.

On the flip side of this is consumption of more material goods as these basic human needs are satisfied. Somswasdi (1991) points out the alarming influence of consumerism with respect to social inequality and gender. An example is middle income families selling their children in order to consume more luxury items. Certainly a caution must be raised with respect to whether such occurrences are frequent or isolated.

Both these examples have implications for environmental education. Economic insecurity requires creative alternative environmental education initiatives due to the nature of being in a "survival mode". Being unequally burdened with welfare concerns can make it difficult for each gender to access environmental education simultaneously, or even at all.

2.2.3.1.2 Access

Access to resources can include access to physical resources such as land, time, and money. The inability to access land, especially in rural communities, can place a burden on women farmers. This can then result in time constraints that make it difficult to participate in environmental education programs. If this is the case, alternative methods of environmental education would need to be investigated.

Access can also involve accessing spiritual resources. In Thai Theravada Buddhism, women are regarded as inferior to men (Sirisambhand & Gordon, 1987). Being born a woman is widely believed to be the consequence of a sin committed in a previous life. One way in which a woman gains merit is when her son enters monkhood (Sirisambhand & Gordon, 1987; Somswasdi, 1991). This difference in access to Buddhism between men and women could potentially restrict women's ability to apply the teaching of Buddhism in a meaningful way to address environmental concerns.

2.2.3.1.3 Conscientisation,

Conscientisation refers to the raising of peoples' awareness of the way in which women and men are similar and different, while still recognising the heterogeneity of each group. In a way this deals with attitudes and social norms.

Examples of conscientisation include recognition of the way laws can influence how we think and how they reflect what we think. Some say the laws in Thailand have changed, from treating women as non-persons to ones who are discriminated against. The sentiment reflected in some laws portrays women as "incompetent creatures who had to depend on and obey their husbands in dealing with all matters" (Somswasdi, 1991:7). As an example, the Family Law within the Civil and Commercial Code 1935, section 1454, states that the husband is the head of the conjugal union, but this was revised in 1976 with the Civil and Commercial Code Book 5, B.E. 2519, section 1461, with a statement that husband and wife were to maintain and support each other according to each of their abilities and conditions in life (Somswasdi, 1991). This shows that the laws are changing. The question then becomes whether the attitudes of the population reflect these directions.

Another example is the recognition of the multiple roles of women. Oppong and Abu (in Richter & Yoddumnern-Attig, 1992) describe seven major roles of Thai women: parental (mother), occupational (worker), conjugal (spouse), domestic (housewife), kin, community (citizen) and individual (self actualizing person). Each role contains various activities and social networks (Richter & Yoddumnern-Attig, 1992). However, disentangling and separating women's roles is difficult (Richter, 1992). The roles, in addition to a changing social order, have led to other difficulties, for example:

> *Besides the fact that traditional roles for women do not suit the modern world, Thai women are also faced with role conflicts that are exacerbated by economic changes. Strain occurs when women do not have time or resources to fulfill their obligations and/or desires.*
>
> *(Richter, 1992:99)*

Recognition by the government of the unique needs of women are addressed in the seventh National Development Plan (1992-1996), which started in October of 1991. There are six major programs and twenty minor ones, which attempt to integrate policies and plans for women. The aims of these programs are to "develop Thai women and their roles in society" (Sethaput, 1992:95).

Within the environmental education process, conscientisation plays a role in the potentially different social norms and attitudes that may be held about and by men and women. Wouters' (1996) study on gender differences in forest practices and environmental awareness, suggests a modest difference between men and women in both these areas. She also found that there is an awareness on the part of rural men and women that gender roles play a part in determining the impact on the environment. Differences in these perceptions may lead to differences in their willingness and their ability to act. These in turn can influence the environmental education process.

2.2.3.1.4 Participation

The options given to men and women to participate in meaningful ways in the larger social fabric can impact the way in which they feel that they can make a difference. One place to turn to see if this is the case is in the occupations available to each. In terms of careers, there is a differentiation based on gender. An analysis of job postings in the Bangkok Post shows:

> *Work that requires patience, carefulness and good human relationships is associated with women; while jobs that require policy making, creativity, power and a higher salary generally fall to men. Even in occupations for both genders, promotion will be more male-dominated by stressing several criteria including working and entertaining at night, an aggressive nature and physical strength. These criteria are the myths of male domination.*
>
> (Chaiphibalsarisdi, 1995:35).

The ways in which men and women are able to participate influences the types of skills they can develop and then transfer to other challenges. The types of skills then developed can also influence the ability to meet both individual and collective needs.

2.2.3.1.5 Control

Control is a strategic need. In order to instigate meaningful social change (one of the goals of environmental education), both men and women need to feel that they have control over resources and decision making. One area in which control is clearly evident is within public office. Within the Thai political sphere, women have played a limited role. In Thailand there are no female ministers, only four percent of the seats in the national government are female and merely six and a half percent of the seats in the local government are female (UNDP, 1995). The question that this begs is what are the barriers for women, especially as one goes higher up in the political sphere? Furthermore, how do women's concerns come to the political arena, even at the village level?

Where the rural Thai women are in this hierarchy of gender concerns can influence the content of environmental education. The type of environmental issues that would be raised, the priorities in terms of values and the skills that are developed may differ depending upon where the women's needs are (on the welfare end or the control end of this hierarchy), both individually and in general as a group.

2.2.4 Measuring Environmental Education Needs

Determining the environmental awareness of a particular population is difficult (Krause, 1993). First, there is the problem of defining the environment. Second, there is the issue of varying motivations for gaining this awareness; from the nature of core beliefs to the nature and extent of perceived threats.

A definition of the environment needs to be agreed upon. Within constructivist epistemology "environment is not something that has a reality separate from ourselves and our social milieux...[it is] a social construct" (Robertson, 1994:29). Thus environmental challenges are also socially constructed. Yet there is little research literature to "inform our understanding of how others…conceptualize environment, environmental issues, and human-environment relationships" (Robertson, 1994:29; Robertson, 1993; Wals, 1992). Examples of indicators of a positive environmental ethic may include:

• love for the earth	[attitude]
• desire to have a low impact on the earth	[attitude]
• practice of methods to decrease personal impact	[action]
• influence others to follow suit	[action]
• understanding linkages between earth and people	[awareness]

How people define the environment is problematic in analysis of environmental awareness, because the unit of analysis varies from person to person. For example, the types of environmental problems perceived will change depending on whether individuals view humans as part of the environment or if they view humans as separate from the environment. Comparing a group of individuals' understanding of environmental issues will thus depend on ones own interpretation of the term environment. This is added at this point, because it is crucial to expose explicitly potentially conflicting assumptions.

2.2.4.1 Researching Children's Awareness of Environmental Issues

The information obtained regarding children's awareness of environmental issues would be very useful for gaining an appreciation of the age at which environmental awareness, (in terms of both accuracy and values) is acquired by children. However, there has been little research regarding this particular area in developing nations.

A study by Cohen and Horm-Wingerd (1993) indicates that children as young as three to five years of age, are able to identify graphically depicted ecological issues with accuracy. An interesting point that is raised by these authors is the difficulty of studying children's knowledge about environmental concerns in contemporary Western society, because the children are often removed from natural environments. This observation raises the question as to whether it would be easier to study rural Thai children's knowledge on the assumption they interact more closely with the environment.

The literature has shown that three different methods have been used to gain an understanding of children's awareness of environmental issues. The methods involve a discrimination task, a comprehension task, and drawing. The methodology employed by

Cohen and Horm-Wingerd (1993) was developed specifically for young children. The discrimination task involves children looking at a pair of drawings and determining which was "nicer". The comprehension task involves children being shown a drawing and being asked "What was wrong with it?" Awareness of environmental issues was thus related to the number of correct responses to each of the tasks.

Another method that has been employed for school-aged children was to have them draw and write about environmental issues. This method was used as both a means of disseminating environmental knowledge as well as researching children's perceptions of environmental issues (Lee-Smith & Chaudhry, 1990). The format involved an annual competition. A poster was distributed to participating schools. The poster consisted of two parts: a cartoon and a series of questions. The children were requested to draw a picture and answer the questions. The responses were then used as data and prizes are given for the best entries.

Each of the three methods described above depend upon a level of visual literacy. If an adequate level of visual literacy was lacking or depictions culturally inappropriate, these methods would be inappropriate.

2.2.5 Access Via Alternatives

In recognising how women's roles differ from those of men and the varying needs among women, there needs to be an understanding of the variety of modes of education that might meet the needs for environmental education.

There are many specific types of non-formal education. Research about teaching methods, shows that there is greater gain and retention of knowledge when there is use of a variety of visual methods to complement audio methods (Goyal & Raman, 1991). But, an equally important question is "Are there particular modes within the context of a specific community that would be more effective in meeting the women's needs for increased environmental consciousness?" Do they all rely on mass media? Examples of alternative modes include tapping into the informal social network (M.A. Singamma Sreenivasan Foundation, 1993) or traditional informal associations (Charlton, 1984) or traditional media, such as popular theatre (CESO, 1993). At issue is which non-formal education strategies are most appropriate for women in Northern Thailand.

Another potential or perhaps existing source of information for women, may be children. Nearly 90% of both male and female children in Thailand eligible to be in primary school do attend, therefore they are a prime audience to determine what is being done within the formal education system. The following chapter includes a section dealing with some of the methodological challenges of researching this area.

2.2.6 Integration of Environmental Education with Whole Development

Environmental education cannot be considered in isolation from a society's entire development. The complexity of environmental issues and the consideration of both social and natural environments within the discussion on environmental issues requires that a holistic approach be taken. "Environmental education must be part of the movement to promote equity in all segments of the population" (Arcury & Christianson, 1993:24).

2.3 Key Concepts:

The literature reviewed provided a number of concepts which guided the study. These guiding concepts are visually represented within Figure 2-1. In assessing environmental education needs it is important to address both content needs and process needs. Content of environmental education refers to what needs to be addressed in environmental education programs. These include environmental *awareness*, *attitude* and *action*. Process of environmental education refers to how environmental education is delivered. There are a number of factors that may detract from or positively influence the process and content components of environmental education. These are referred to as barriers or motivators, respectively. Within this study, gender analysis was used to determine if gender roles create barriers to the process of environmental education or to environmental *action* (one of the content components of environmental education). Gender analysis within the context of this study involved investigating welfare, access, conscientisation, participation and control. An area that was not addressed within this study are the motivators. These would be those factors that nurture both the process and the content components of environmental education.

These key concepts guided the research process. It was instrumental in the design of questions asked and provided a framework for the data analysis.

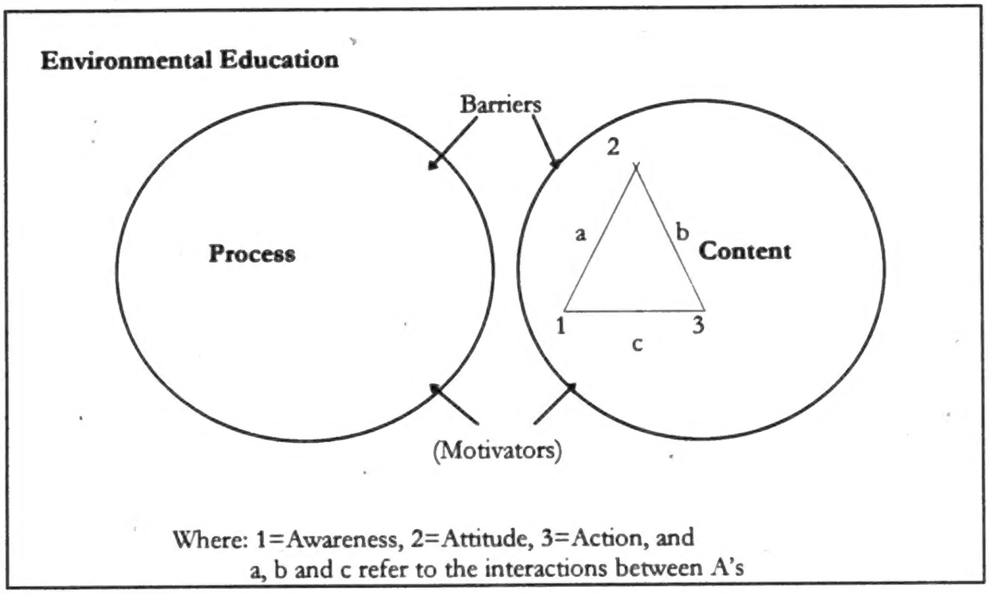

Environmental Education
Barriers
Process
Content
2
a
b
1
3
c
(Motivators)
Where: 1=Awareness, 2=Attitude, 3=Action, and
a, b and c refer to the interactions between A's

Figure 2-1: Key Guiding Concepts

3. Research Method

This chapter is divided into three parts. The first part is a *description* of the research method, and the second part is an *analysis* of the research method used. The last part focuses on the *assumptions* about the methods used in this study and the issues of reliability, validity, trustworthiness and accuracy.

3.1 Design Overview

The research undertaken in this study was based on a combination of qualitative and quantitative approaches, with an emphasis on the use of qualitative methods. Considering the exploratory nature, the cross-cultural setting, and the short time frame (four months), using a predominately qualitative approach enabled the investigator to avoid making unwarranted assumptions upon arrival in Thailand. A combination of qualitative and quantitative approaches was required to gain a more holistic understanding of their environmental awareness and needs: a better foundation on which to build an environmental education program, since one of the main objectives of the study was to provide recommendations on environmental education for women in the village.

The combined research methods were used in both the collection and analysis of data from key informants in informal interviews and participants of the formal interviews. Interview schedules were constructed using primarily an open ended approach, with some closed-ended questions, following the open-ended questions (Gall, Borg, & Gall, 1996). Interviews were conducted in such a way (i.e. using systematic random sampling) that some of the results could be quantified and generalized to the village population.

3.1.1 Description & Analysis of Process

3.1.1.1 Selection of Issue

The topic of this research originated from observations made during the investigator's visit to India, during the summer of 1994. Casual conversations with men, women and children led her to suspect that women's needs for environmental education were not being met through state run public environmental education programs. This observation led her to examine potential reasons that women were uninformed and to entertain possible alternative means of providing environmental education to women. The literature review confirmed the need for a study of this nature.

3.1.1.2 Site Selection

The University of Alberta and Maejo University have a formal institutional linkage through a CIDA project entitled: ***Human Resource Development for Sustainable Agroforestry and Environmental Conservation in Northern Thailand.*** It was through this linkage that the opportunity to do research in Thailand became possible. A village in Northern Thailand was selected for this study. Ku Daeng, was chosen primarily because of background information available through ethnographic studies (Kingshill, 1960; Kingshill, 1991) that were first conducted in 1954, and at ten year intervals after that until 1984. These studies provided an appreciation of some of the cultural context in which this study was conducted. As these studies provided a limited consideration of gender roles, it was felt that gathering more information on gender and natural resources could add to the information already gathered.

3.1.1.3 Sample Selection

Based on field observation and in consultation with the field supervisors, four different formal survey groups were chosen. In addition to these formal survey groups, informal interviews were conducted with the villagers, as time and need arose. The survey groups, however, were determined more systematically, based on gender, age, and intent, as described in Table 3-1. Group 1 consisted of children aged 6-12, Group 2 consisted of youth aged 13-17, Group 3 were women 18 years and over, and Group 4 consisted of both males and females over 50 years of age. The focus of Groups 1 and 2 were environmental issues, and that of Group 4 was gender issues, whereas Group 3 focused on a combination of both environmental and gender issues. These groups were chosen because it was believed that they could provide the best combination of information to fulfill the objectives.

Table 3-1

Overview of Each Sampled Group

Group	Age Range	Gender	Interview Focus	No. Interviewed
1	6-12	Female & Male	Environment	11
2	13-17	Female & Male	Environment	11
3	18+	Female	Environment & Gender	81
4	50+	Female & Male	Gender	46

The sample was based on a systematic selection of 15% of the population within each survey group. The numbers sampled are summarized in Table 3-1. A sample of 15% was used because it provided a suitable number of persons who could be interviewed in the time frame available. The informal interviews conducted throughout were based on availability of individuals. Informal interviews were also conducted at the end of the study with the Abbot[2] and the two headmen of Ku Daeng.

3.1.1.4 Data Collection

3.1.1.4.1 Design

There were three main phases of this research in the field: (1) the participatory observation phase, (2) the field testing phase and (3) the formal interview phase. The first phase, the participatory observation phase, never really ended until the investigator left the village. All observations and informal interviews were documented within field notes, which were coded and analysed, and are presented within the discussion section. The participatory observation phase involved: doing initial research to gain information about the current situation of the village, informally surveying local currently available environmental education programs (including the formal school curriculum, access to media, etc.), documenting observations made while living in the village and conducting informal interviews. It was during the initial weeks of this first phase that the formal interview schedule was refined to address issues that were revealed during the process of initial observation. This interview schedule was then further modified by the Thai field supervisor from Maejo University to fit more appropriately within a Thai context, and was then translated into Thai before a field test was administered. The intent of the field test phase was to ensure that the tool used was appropriate and effective, as well as to ensure that the interpreters understood the tool and the process. Early in the research it was decided that in order to increase the number of interview schedules that could be administered, two additional interviewers would be required. The two additional interviewers conducted the interviews entirely in Thai and following each days set of interviews, the interpreter would interpret the Thai responses into English. Following the field tests of each of the interviewing tools, modifications were made to increase the effectiveness of these tools.

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[2] An Abbot is the head monk in the temple

One issue that often had to be reexamined by the investigator in collaboration with the Thai field supervisor and the research assistant, was the interview schedule intent. For example, in section C of the interview schedules for Groups 2 and 3 (see Appendix A.1), it was suggested that one of the questions be changed from " why was clean water important" to "why clean *drinking* water was important". Upon reflection of the initial intent of the question, the investigator realized that the question was used as a means of determining *attitude* towards the environment, and how the environment is defined. For example, if the response was that it was important for drinking (human consumption) then the investigator could gather a fairly ethnocentric view. But if there was also recognition that other beings relied on the same supply, and that it was important to keep the water supply clean, say for the fish, birds etc., then the investigator could see a more biocentric view.

Another issue that needed to be resolved was interview schedule wording. Sometimes when a question was translated, the intended meaning was not attained. When this occurred the interview schedule was reworded to get at the intended meaning. In other cases, some words did not need to be specified in Thai, like "in your opinion", or "to you", because inevitably whatever was stated would be according "to their opinion", "to them". This was the cultural norm.

Though reference is made above to *phases* of research, they were not completed in any linear order, nor exclusively from one another. More than one phase was active at any given point in time. The word "phase" is used merely to conceptually separate the various components, so that it is easier to discuss.

3.1.1.4.2 Ethical Considerations:

Ethical considerations need to be addressed whenever research is conducted. The aspects of ethics that had the greatest relevance to this study are consent, time and repayment issues.

3.1.1.4.2.1 CONSENT AND TIME

Approval of the country and the community to conduct this research was obtained from the National Research Council of Thailand (NRCT), the local agricultural extension office and both village headmen and the Abbott of Ku Daeng. The local agricultural extension office, the village headmen, the Abbott of Ku Daeng and the investigator's host were initially contacted through the investigators local Thai supervisors. The University of Alberta Faculty of Agriculture, Forestry, and Home Economics Human Ethics Review Committee, approved this study and deemed formal signed consent forms unnecessary in a study of this type. In order to maintain confidentiality of data and identities, names were not included on the interview schedules. The investigator and the topic of the study were introduced to the village as a whole, at a temple gathering. Those doing the interviewing were introduced to the village headman. The headman of one of the hamlets then made an announcement via loudspeaker to the villagers introducing the external interviewers and reminding the villagers about the study. Prior to each interview, the respondent was introduced to those conducting the interview, the topic of the interview, they were advised of their anonymity and rights to withdraw. The respondents were also informed about the maximum length of time the interview schedules would take, before being asked if they wanted to participate, and if the current time was convenient. No one objected to participating. If the scheduled time was inconvenient for the respondent, alternative arrangements were made.

3.1.1.4.2.2 REPAYMENT

Sufficient repayment to individuals and the village, for their cooperation in a research project, and their time is always a difficult thing to ascertain. Though they could never be fully compensated, the investigator tried to be as open and helpful to the villagers, as possible. Opportunities to help the village as a whole were seized. One example was in regard to household cards. Household cards are records about the people within each household. Information such as names, gender and age were found on each card. When the investigator discovered that some of the household cards were inaccurate, she kept an ongoing record of inaccurate data, so that the village headman would be able to correct the errors more easily. In addition, the investigator participated in community events and before leaving contributed to the village scholarship fund to help less fortunate students receive an education.

3.1.1.4.3 Research tools:

The research tools that were used included informal interview guides and formal interview schedules. The initial interview schedule was developed in Canada. After consultation with Thai professionals and preliminary investigations in the field, it was modified and refined as noted above. Each of the tools is described below and samples (both Thai and English versions) are included in Appendix A, in order to aid in the understanding of the nature of this study.

The purpose of the interview guide was to facilitate the initial informal interviews, to gain an understanding of local definitions of the term "environment", to do some preliminary investigations of local environmental issues, and to facilitate the closing informal interviews. The interview schedules were used to facilitate the initial formal interviews. The interview schedule was translated into the local language before use. Interview schedules were used for Groups 2, 3, and 4. After a pre-test was done in the field, an age-appropriate method was developed for Group 1. A more thorough look at how the interview schedule was designed to fulfill the objectives follows (see Interview Schedule Structure).

3.1.1.4.3.1 FIELD NOTES:

There were two main types of data included in this study; that which came from observations and informal interviews and that which came out of formal interviews. The data from observations and informal interviews were documented within field notes. Much of the interview schedule emerged from this preliminary data. For example, at the end of each day, especially those within the first month in the village, questions that came forth from each day's observations were recorded. As the interview schedule and informal interview guides were being developed, reference was made to these questions to determine the content of these tools. Field notes also documented different styles of asking questions. These too were referred to when the design and wording of each of the interview schedule questions was being developed. In addition to documenting suggestions for the research process, the field notes were also used to document observations that would later be analyzed as data relating to the objectives of the research.

One of the difficulties in keeping field notes, was the level of motivation required to ensure that the notes were kept vigorously. Having constant access to the computer became important, as merely jotting things down on paper, often meant having to elaborate later when the investigator had access to the computer. The longer the investigator waited, the more likely retention decreased. Thus one of the limitations was that though many of the observations were recorded, inevitably not everything could be. An overview of the field notes revealed that earlier entries provided more of information related to the process of doing research, whereas the latter entries provided more information related to the objectives of the research.

3.1.1.4.3.2 INTERVIEW SCHEDULE STRUCTURE

There are many different levels in which one could look at the structure of the interview schedules used. On one level, four purposively designed forms of the interview schedule were used. At another level, there was some overlap among them. For example, Groups 2 and 3 shared all the questions dealing with environmental issues, and Groups 3 and 4, shared the section dealing with gender role valuation.

3.1.1.4.3.2.1 GROUPS 2 & 3 INTERVIEW SCHEDULE OVERVIEWS:

As noted above, people can perceive the environment in many different ways. Consequently, a number of questions were asked to gain a better understanding of how these individuals participating in this study defined and valued the environment. For example, the number of issues raised were assumed to give an understanding of how broad the awareness of environmental issues is within the community of Ku Daeng.

Questions were also asked to determine the extent of awareness of the local environment and local environmental issues. The greater the number of types of changes noticed would indicate a greater level of awareness of their surroundings. Lack of the awareness of change in any particular area, may indicate future issues for environmental education to tackle. This portion of the interview schedule was constructed to relate to other studies- particularly Wouters (1996) and Flaherty et al. (Flaherty & Filipchuk, 1993; Flaherty & Jengjalern, 1995), because these studies were completed in Northern Thailand.

Other questions examined the participant's understanding of the consequences of environmental issues and who they feel should be responsible for dealing with these issues. Identifying what measures were currently being employed by an individual also helps to get a sense of personal responsibility. Environmental *awareness,* without *action* and a sense of responsibility is somewhat superficial. Asking what prevents them from acting also gives an indication, in a different way, of the perception of responsibility, as well as providing a list of barriers to local *action.* One way in which this was done, was through the use of photos. Five out of a total of seven photos were shown to the respondent, one photo at a time. Table 3-2 provides the identifying title and a brief overview[3] of the themes in the photos as defined by the investigator. They were then asked to discuss what they saw in the photo and whether it was a positive or negative situation. If negative, the respondent was then asked what he or she could do to improve the situation, and why the situation still existed. The photos were taken from within the district of Sarapi, so they all portrayed images that were familiar to them. These photos are included within Appendix A.3.1. There were four women in Group 3 who had difficulty with their eyesight. They were not required to answer the questions about the photos.

One of the final sections of the interview schedule asked about the individual's previous access to environmental education. The intent was to determine what sources were being effectively accessed and what sources were perhaps not.

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[3] These descriptors were not presented to the respondents at the time of the interview, the titles and themes are included here for information only.

Table 3-2

Photo Themes Used for Groups 2 and 3 Interviews

Photo	Title	Issues photo raised according to the investigator
A	Dirty canal	• pollution, responsibility
B	Separating garbage	• waste disposal, consumption, environmental education
C	Bottles in orchard	• disposal, toxic waste disposal, environmental education, chemical use
D	Common land dump	• aesthetics, law of commons, environmental education
E	Roundup-herbicide	• chemical use, environmental education
F	Burning garbage	• air pollution, environmental education
G	Dumped leaves	• waste stream, environmental education

Table 3-3 shows the main sections of this particular interview schedule. Section G was present for Group 3, but not for Group 2. Questions relating to environmental *awareness, attitude* and *action* were present in all sections except G. Questions relating to environmental education were present in Sections A, E, F and G.

Table 3-3

Overview of Interview Schedule Structure for Groups 2 and 3

Section	General Focus:	Specific Focus Area
A	Environmental perceptions:	Definition of local environmental issues
B	Environmental perceptions:	Degree of attention to change
C	Awareness, attitude, and action with respect to:	Water issues
D	Awareness, attitude, and action with respect to:	Waste disposal issues
E	Awareness, attitude, and action with respect to:	Discussion surrounding photos
F	Sources of environmental education	
G	Gender issues:	Barriers and value

3.1.1.4.3.2.2 GROUP 1 INTERVIEW SCHEDULE OVERVIEW:

The interview schedule for Group 1 was in the structure of a two part game. In the first part the children were shown a total of six photos (dealing with environmental issues) and asked whether they liked or disliked the photo. The children were then asked why they liked or disliked the photos. Their reactions and reasons were documented. In the second part, the children were shown five pairs of different photos and asked which they liked better and why. Their reactions and reasons were again documented. The photos used appear in Appendix A.3.2. Following in Table 3-1 is a brief description of the photos used.

Table 3-4:

Overview of Photos Used for Group 1 Interviews

Set	Part 1: Like/Dislike?	Part 2: Which is better?	
	Photo	Photo 1	Photo 2
1	tall grass	dirty canal	clean canal side
2	burning garbage	dump on common land	wet & dry separation
3	burned dump by water	dumping leaves	burning leaves
4	enviro-symbol	firewood	gas
5	washed plastic bags	paper bag	plastic bag

3.1.1.4.3.2.3 GROUP 4 INTERVIEW SCHEDULE OVERVIEW:

The interview schedule for Group 4 was split up into three sections: gender roles, attitudes towards gender and an analysis of who currently did certain activities within the village. The first section contained questions that indirectly raised issues of equal opportunity, control, access and decision making. The second was set up in the format of statements with which the respondent could either agree or disagree, and then explain their choice. In the third section, the respondent merely had to indicate whether men, women, boys or girls did a specific activity, or whether it was now obsolete. The activities that were listed are modified from the one presented in Kingshill's original 1960 study of Ku Daeng.

3.1.1.4.3.2.4 DESIGN OF INTERVIEW SCHEDULE QUESTIONS:

The questions used within the interview schedules ranged from open ended to closed ended. For Groups 1-3, photos were used to aid in introducing a variety of environmental issues. The questions for the most part came out of observations documented within the field notes, discussions with the local interpreter and field supervisor. Some of the questions that appeared within the field notes did not appear on the final version of the interview schedules, because they were too vague, they involved definitions that could be problematic (for example the terms "environment" and "sustainable"), or because they were not as relevant to the local situation.

3.1.1.4.3.2.5 BACKGROUND INFORMATION:

For the most part background information consisted of demographic data. Though some of this information such as age, was known in advance from the household cards, it was asked during the interview, as a check to ensure the right person was interviewed, and that the appropriate interview schedule was administered. There were a few cases where this proved to be a necessary check. Different types of background information were solicited from each of the groups based on what was deemed pertinent to the analysis.

In Kingshill's initial study (Kingshill, 1960) he stratified the population socio-economically by the type of house they had. At that time, disposable income was invested in household improvements first. Thus, a higher socioeconomic status could be discerned by the type of house. Within his latest book (Kingshill, 1991), he indicated that, now socioeconomic status was more measurable by material goods (radio, gas stove, fridge, TV etc.). Initially, the investigator thought of using these as a proxy for socio-economic status, but a discussion with one of the interpreters indicated the difficulty in obtaining accurate information. Furthermore, it was perceived that one of the strengths of the interview tools was that it did not put respondents on the defensive. Since a large segment of the population appeared to be relatively well-off, the investigator chose to exclude this variable. In hindsight, the investigator thinks it may have been valuable information, if there had been a more accurate, non-offending way of obtaining it.

3.1.1.4.4 Scheduling and Interviews

3.1.1.4.4.1 GATHERING DEMOGRAPHIC DATA:

Before sampling could take place, an attempt was made to get a reasonable approximation of the demographic data available for the households within each *moo*[4]. This was achieved by referring to two different sources of information. Each household has a computerized household card which is kept within the district office. One of the headmen retrieved these cards, the other headman gave access to a book with similar information which he updated himself. The data collected included gender, ages and total number of people present within each household. The data were checked over by the research assistant, as she had lived within the village all her life and knew most of the families there. Some of the data were found to be inaccurate, as some people who were marked as leaving the village had actually returned, and there were a number of people who had died, yet the data did not reflect this. Even though the data were looked over by the research assistant, during the course of the interviews, we still discovered that there were other people listed who had either passed away or moved. Thus, the overall figures that were presented were not entirely accurate. Since there were only a few errors that were discovered, we were not overly concerned. It was assumed to be a random issue with possible exception of deaths by older people.

3.1.1.4.4.2 SCHEDULING THE INTERVIEWS:

Interviews were conducted primarily in the late afternoon or in the evening to accommodate the schedules of the respondents. Scheduling of interviews depended upon availability of the field assistants, their access to the village, and the availability of the respondents.

There were two options to determine the interview schedule. One involved going to each sampled household, leaving a card with the promise to return at another time. This would enable us to ask when it would be convenient to do to. The other involved going to each sampled household and conducting the interviews on the spot provided that it was convenient for them to do the interview. If not convenient, a more suitable time was jointly agreed upon. Due to time constraints, the number of simultaneous interviews, and the fact that during the initial set of field tests interviewing scheduled via the first method did not appear to be particularly effective anyway, the second method was used. Scheduling of the formal interviews took place a week in advance of the interviews. Scheduling was in large part accomplished with the aid of the local interpreter. Appointments were not made with the respondents in advance unless the time we arrived was inconvenient.

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[4] *Moo* is the local term for hamlet.

The interviews varied in the amount of time they took. Group 1 interviews only took between 5 and 15 minutes, whereas Group 2's and 3's ranged from 25 to 60, and Group 4's ranged from 20-40 minutes.

3.1.1.4.4.3 INTERVIEWING CHILDREN:

Children were interviewed to see if they act as a source of environmental education for their mothers. One dilemma was to determine at what point they should be interviewed: before or after their mothers? Either way, each might be influenced by the other's response. It was suggested that the children be interviewed first. From the field test, the investigator found that especially for Group 2, the mothers would then often have already heard the question and their child's response, and thus have a different setting than those women without children. One option was to have the children leave the room, initially, while their mother was interviewed. After this interview, they would be asked to return. They would they be interviewed with their parents in the room, so they would feel more comfortable. In the end this whole issue was not as large a problem as initially anticipated. A few times when the mother was interviewed the child was not present. When both were present two different interviews were conducted simultaneously in different rooms.

3.1.1.4.4.4 INFORMAL INTERVIEWS

Three closing informal interviews were conducted by the local research assistant and the investigator after the data was inputted into the computer. A sample of the informal guide is in Appendix A.4. These interviews dealt with concerns that were raised through observation and through responses of survey respondents. Some examples of areas in which further information was solicited included the skin factory incident (refer to 5.3.3), the loss of the village school (refer to 4.1.4.2.), and the spraying of DDT. The spraying of a mixture of gasoline and DDT within the village was mentioned as a means of dealing with malaria. The village is sprayed one to two times a year at the request of the headman. One of the headmen felt that the spraying did not result in the decrease of mosquitoes. He felt that the presence of standing water, made it difficult to control the mosquitoes. Considering the negative ecological effects of DDT, the investigator was left puzzled as to why DDT was used. The headman did not appear to be aware of the negative effects.

3.1.1.4.5 Field Assistants:

Four people aided with interviews in the field. For clarity, they will be referred to by the primary tasks in which they were involved. Table 3-5 provides a breakdown of these roles and Table 3-6 describes some characteristics that will be discussed below.

Table 3-5

Breakdown of Field Assistant Roles

Field Assistant	Interviewer	Interpretation	Research Assistant
A	Yes	Yes	Yes
B	Yes	Yes	
C & D	Yes (solo)		

Field Assistant A was directly involved in designing the interview schedule questions, scheduling, dealing with logistics, interpreting as required, and helping the others with translation into and from the Northern Thai dialect (Kamayeung), as well as conducting all informal and Group 1 interviews. She also conducted a few of the Group 3 and 4 interviews (acting more as a backup to the others) and played a key role in gaining access to the village. Field Assistants A and B, conducted interviews with the investigator present, so the interviews were interpreted immediately and the investigator documented the information in English. Field Assistants C and D both conducted the solo interviews in Thai, thus recorded the responses in Thai. These were then translated post-interview, either each evening or the following morning.

Table 3-6

Select Field Assistant Characteristics

Field Assistant	Primary Duty	Gender	Insider or Outsider
A	Research Assistant	Female	Insider
B	Interpreter	Male	Outsider
C and D	Interviewers	Male	Outsider

The three male field assistants (B, C and D) are Masters students from Maejo University, whereas the female field assistant (A) is a primary school teacher, who lives in the village. Field Assistant B's family is from Northeastern Thailand, he spent most of his early schooling in the United States of America. Field Assistants C and D had grown up in Thailand. Research methodology issues surrounding multiple assistants, gender, insider-outsider, and translation will be briefly elaborated below.

3.1.1.4.5.1 MULTIPLE ASSISTANTS

The use of multiple assistants required that a degree of consistency was maintained. This was achieved through a variety of means at different stages of the interview process. Initial briefing sessions prior to interviewing enabled clarification of the intent of the study. Field tests enabled the assistants to become familiar with the research tools and to learn from each other. A memo accompanied each set of blank interview schedules to outline procedure. The memo included a reminder to ensure that introductions of the assistants and the survey preceded each interview, in addition to ensuring that consent was obtained. An attempt was made to ensure that debriefing sessions followed each interview set, to enable concerns to be dealt with as they came up, however, sometimes due to the intensive interview process, there were times when this was not possible. Then they occurred, these meetings provided a forum to discuss unusual or interesting responses. One example of an issue that was brought up was how to deal with husbands who tended to interject responses during their wives' interviews. It was decided that the men would be gently reminded of the purpose of the interview. In addition, it would be documented when someone other than the respondent was assisting in providing an answer. These meetings in the end, served the purpose of ensuring consistency of procedure, sharing concerns with each other and ensuring meaning was managed. A wrap up debriefing session allowed for observations on the interview process to be discussed and documented.

3.1.1.4.5.2 GENDER ISSUE

One issue that could be controversial in the Thai village context was whether having male interviewers was problematic, particularly for the interviews with women and girls. The quality of the responses suggests that this was not an issue, though this was difficult to determine, since there were more differences other than gender, for example: age and insider-outsider. The investigator recalled at least one occasion, when one father sat in on the entire interview of his daughter which was conducted by a male assistant. One example of a procedural issue that the investigator observed and was also observed by the male field assistants, was that Group 2 interviews with female respondents tended to be longer (1-1.5 hours).

3.1.1.4.5.3 INSIDER/OUTSIDER ISSUE

There were obvious advantages in having a local field assistant. First, access was easier to achieve as the research assistant is a respected, long standing member of the village. Language was not a barrier to her and she knew the cultural customs and taboos. Some of the disadvantages included that she had something at stake, because it was her village that was being studied. As well, sometimes it was difficult to sort out her thoughts from those of the respondents, as sometimes she led the question. Though because of the positive rapport between the research assistant and the investigator, this was easy to determine and resolve. This rapport also enabled the other villagers to view the investigator as more of an insider than the other three field assistants, especially since the investigator was living in the village during most of the study.

3.1.1.4.5.4 TRANSLATION

Translation occurred at three different points. The first was when the interview schedules were translated from English to Thai. The second and third involved Thai being translated into English. The second being during the interview in which the investigator was present, while the third was post interview (for the solo Thai interviewers). When the English version was translated into Thai, it was beneficial for the investigator to be present while it was being translated, as it allowed for clarification of the intent of various questions, which in turn made it easier to find alternative ways of asking the questions, so that it was in "lay person's" terms. It was also important for the interviewer to be present when the Thai responses were translated into English, in order to clarify what was meant by a certain response, as was required.

In addition, before leaving Thailand, the investigator ensured that at least the Group 3 and 4 interview schedules were put into the computer to be sure that the translations were understood. In this manner, concerns that were found were for the most part dealt with before leaving Thailand.

3.1.1.4.6 Taping

In order to ensure consistency of the interviewers, at least one field test or initial interview for each group was taped. The interviewer was then requested to listen to the tape and determine areas which needed to be improved upon. This process was also repeated at the end of the interviews to see how style may have altered over time. In addition all the Group 1's and the informal interviews were taped to serve as a backup of the interview, and to ensure that the interviewer did not lead the responses, as all of these interviews were done by the research assistant.

3.1.1.4.7 Field tests

Field tests were completed for three reasons: to ensure that the research tool was effective, to ensure that the interviewer understood the tool, and to ensure both immediate and delayed translation were not too difficult to achieve. A total of ten people were field tested. The field assistants indicated that it was beneficial for them to field test the interview schedule questions.

3.1.1.4.8 Investigator's Role

The investigator's role will be briefly discussed in terms of five areas: clarification, observation and language barriers, background and influence.

The first area is clarification. This is in reference to the translation of the interview schedule questions from English to Thai, as well as field tests. The investigator was present during the translation from English to Thai, in order to clarify intent of each of the questions, as required. The investigator was also present during the field tests to clarify intent of questions whenever, either the interviewer or the investigator felt the need to elaborate.

Observation while doing research never ends. Even when the investigator was not in Ku Daeng, this did not mean that her mind had left it. Comparison was often made of what was seen outside of the village to those things observed within the village and vice versa.

The investigator discovered, that though very curious by nature, often questions got somewhat stifled because of the communication barriers. There were often more questions than could be asked because of the difficulty to simplify them into easier English. There were also times when some questions got interpreted incorrectly and the responses obtained would be to questions that had not been asked. Sometimes, the investigator would prod on till the initial question was answered, but sometimes, the question would be dismissed. This was to ensure that she was not perceived as being particularly annoying.

The Asian background of the investigator appeared to give a positive impression to those encountered. On a number of occasions, the investigator was told that her presence was seen as open, rather than threatening, because she was seen as more of a neighbour than a foreigner. Field Assistant B also pointed out that having an Asian background made it easier to be more accepting and understanding of cultural differences rather than judgmental. His own experiences abroad helped him to come to this conclusion. This perception, enabled the investigator to be more accepted by both the field assistants and the villagers.

Another observation was the effect that the investigator had on her host family. Choices made and discussions surrounding environmental issues often led to subtle changes in actions of her host. For example, plastic yogurt containers were transformed into craft materials for the students at the school. These changes left the investigator to realize the impression the research process itself made on the environmental consciousness of those she met. This confirms the importance of the process within environmental education.

3.1.1.4.9 *Analysis*

3.1.1.4.9.1 INITIAL DATA ENTRY

Before leaving Thailand, all data from the Group 3 and 4 interview schedules (the largest groups) were put into the computer using Excel software. All field notes and interview schedule data were then stored onto disks. This was done for a number of reasons. Disks were easier to transport than paper. Multiple copies could be made efficiently, therefore paper could be conserved. An important factor for a resource conscious mind. In addition, the interview schedule data could quickly be transferred into SPSS, enabling the next stage of coding to be started more quickly. The process of inputting the data onto disk, also gave the investigator the opportunity to go over all the data before leaving Thailand. This was beneficial in two ways. The information could be therefore be used to facilitate the closing informal interviews. As well, the investigator could ensure that all the translated responses were understood. The multiple copies were then stored in separate locations, to guard from a complete loss of data. The data entry itself was very time consuming, and mind numbing. The data were double-checked after inputting, since the investigator suspected that the mindless nature of the task could lead to a greater number of errors in the process of entering it. This of course increased the time it took to get completed, but at least there was greater assurance that the data was accurately recorded from the inputting stage. The investigator could not so closely control the initial documentation on behalf of the interviewers.

Initially, the intent was to code the data before leaving Thailand, but because the data entry itself took so long, this was left for after leaving. Coding was then completed by five different individuals, in order to save time.

3.2 Discussion of Assumptions

The first assumption that was made was that female and male gender roles create different opportunities for access to different types of information. An examination of barriers should provide enough information to determine if this assumption was valid.

The number of issues raised may give an understanding of how broad the awareness of environmental issues are within the community. The investigator suspected that this would increase with both education and experience. The most important local issues may reveal some commonalties among villagers and suggest the creation of some forum to deal with these issues. This may also reveal the diversity of issues that are of importance to each individual depending upon their particular circumstances. The "why" is asked to gain a better understanding of the value of the environment, whether it has primarily intrinsic or extrinsic value, in the eyes of the individuals.

The formal interviews were intended to be one part of the entire research study. The observations documented in the field notes and the informal interviews are just as vital to obtaining a clearer picture of the objectives as is the information in the interview schedules. In some instances these served as a means of achieving triangulation, at other times they provided unique information that could not have been obtained through the formal interview method alone.

Both qualitative and quantitative methodologies were used. In some ways the qualitative data served as a precursor to the quantitative data, though the initial findings of the interview schedule data were also further examined through informal interviews.

3.2.1 Reliability, Validity, Trustworthiness and Accuracy

Considering validity and reliability and their counterparts of accuracy and trustworthiness would be appropriate, since the method used was a combination of quantitative and qualitative methods. Most of these issues were addressed throughout the methods section. The following serves to highlight some of the key issues.

Validity refers to the appropriateness, meaningfulness and usefulness, whereas reliability refers to the consistency of measurement (Gall et al., 1996). Trustworthiness refers to whether the information is genuine and accuracy to the correctness of the information.

Validity and reliability issues were critical with respect to the survey tools. One example in which internal validity of the interview schedule was achieved was by ensuring that the design of the interview schedule was such that ***awareness, attitude, and action*** were approached using different issues, so that common aspects could be further delineated. An example is the use of both questions and photos to gain an appreciation of the depth of knowledge and attitudinal framework and responsibility associated with a given issue. Another example pertaining to content validity is in consulting with Thai professionals to ensure that the interview schedule itself and the translation of it were culturally appropriate.

One example where reliability issues arose was with respect to having three field assistants. Field tests and debriefing meetings were incorporated in order to ensure that the process being followed by each was consistent. Meetings also enabled questions and concerns to be raised on an ongoing basis and dealt with immediately. Trustworthiness was achieved primarily through data, methodological and investigator triangulation (Cantrell, 1993). In addition to using four groups for the surveys, three leaders in the village were interviewed through an informal process, observations were recorded in field notes and the research assistants aided in making sense of the observations documented. Accuracy was not so much an issue since the questions asked were not intrusive. In addition, the atmosphere was very much one of sharing, rather than imposing.

Chapter 4

4. Findings

This study examines environmental issues as understood by northern Thai women and their children and makes recommendations about meeting these women's environmental education needs. The findings chapter includes 1) a description of the study area-the northern Thai village of Ku Daeng, 2) a description of the participants, and 3) a description of the views related to gender, the environment and environmental education.

4.1 Description of Study Area:

This section briefly outlines ecological conditions, history, human ecology, institutions (government, education and religion), kinship & family, means and methods of making a living and cultural values, in the Ku Daeng research site. Most of this information was obtained from studies of Ku Daeng conducted in 1954 and 1984 (Kingshill, 1960; Kingshill, 1991). This information was supplemented with observations made while the investigator was in the village, between June and September of 1996.

The results of the original study and restudy undertaken by Kingshill also indicate some issues with respect to gender. Although gender analysis was not directly addressed in the previous studies, it can be inferred in some areas. There have been both positive and negative glimmerings with respect to how tasks are or are not gendered. Some of these issues are raised within each of the subheadings that were described above.

4.1.1 Ecological Conditions:

Ku Daeng is a village comprised of two hamlets[5], known as Moo 6 and Moo 7. The village itself is located within the Nong Fag Commune, which is composed of a total of 7 hamlets. Nong Fag is one of 12 communes within the Sarapi District. The Sarapi district is one of 17 districts within the province of Chiang Mai, a northern province in Thailand. There are a total of 76[6] provinces within Thailand. Refer to Figure B-1 and Figure B-2 (located in

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[5] **a hamet is referred to locally as a *Moo***

[6] **Kingshill's original study lists 70 provinces. However, currently there are 76 provinces within Thailand according to more recent sources (i.e. www.odci.gov/cia/publications/nsolo/factbook/th.htm).**

Appendix B) for a perspective on the location of the district in relation to Thailand as a whole, and the village in relation to its district, respectively. Table 4-1 summarizes the administrative structure for Ku Daeng (Kingshill, 1960).

Table 4-1

Administrative Structure for Ku Daeng

Unit:	Name of Unit	Composed of...
Country	Thailand	76 provinces
Province	Chiang Mai	17 districts
District:	Sarapi	12 communes
Commune	Nong Fag	7 hamlets
Village	Ku Daeng	*Moo* 6 *Moo* 7

The village of Ku Daeng is located ten kilometres south of the largest city in northern Thailand, Chiang Mai city. Ku Daeng, like the rest of Thailand, has a tropical monsoon climate. The temperature ranges from 20.9 ^{0}C to 28.8 ^{0}C, with a mean annual temperature of approximately 25.6 ^{0}C. The soils in the area are old alluvium, red-yellow podzolic soils, which are constantly enriched by silt from the river. The main source of water is the Mae Ping River, which is dammed in various locations to fill irrigation canals which are used by the villagers. The monsoon rains are a secondary source of water.

4.1.2 Brief History:

The history of Northern Thailand is unique. At the end of the 13th century, this area was an independent country, with Chiang Mai as the capital. It was known as the Kingdom of La Na (Wyatt, 1984). At the end of the 19th century, La Na sought aid from the Thai Army to help defeat the Burmese during a war it was having. The Thais defeated the Burmese, and gradually the La Na lost its independence to Thailand. Thus, as the Lanathai and the Thais have different backgrounds, it is not surprising that there are differences within the two cultures, including differences in language. The Northern Thai dialect is known as Lanathai, and is Ku Daeng's language of choice in daily affairs, though Thai is used in administration and taught in schools. Currently, a mixture of central Thai and the local dialect, known in Ku Daeng as Kameyeung, is spoken.

4.1.3 Human Ecology

The pattern of settlement in Ku Daeng is different from most other villages in Thailand (Kingshill, 1960). Rather than a group of houses strung along a waterway or road, or a cluster set among the trees and fields, in Ku Daeng, the residential area surrounds the agricultural field. There is a road (which historically was most functional during the dry season), that for the most part surrounds the field, between the agricultural and residential area. Refer to Figure B-3, in Appendix B, for a map of the village.

The general age and gender distribution based on the data prepared by the headman in his reports to the head district is indicated in Figure 4-1. There are a total of 522 females and 550 males, for a total population of 1 072 people within the village.

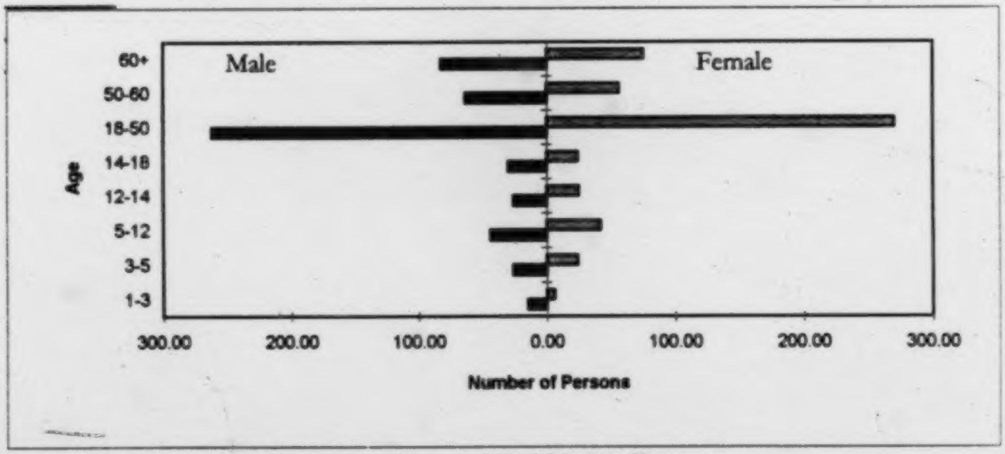

Figure 4-1: Histogram of age group frequencies within Ku Daeng

Overall the village gives an impression of reasonable affluence. Most of the houses have been changed from bamboo and wooden structures to brick and mortar. The average size of a household was 5.0 persons in 1953. There are no figures available on the average size of a nuclear family. However, the average number of children was 3.5 per family.

In Kingshill's (1964) study, prestige ratings were determined. The prestige rating of those who were respected and sought for advice revealed that the highest prestige was given to the Abbott, followed by the Kamnan[7], and in order the Monk, the headman, and the temple leader. The total number of people identified within this category was 36. The list included at least five women, who were deemed influential.

4.1.4 *Institutions:*

There are three institutions, government, education and religion that are important within the village. Each will be further discussed.

4.1.4.1 Government

The government structure consists of a five level system, with two of these having the most relevance to villagers' daily lives. The general structure and process of selection is shown in Table 4-2. The first level was the Ministry of the Interior, then the provincial Governor, then the district office, followed by the commune Kamnan, then the headman.

Table 4-2

Government Structure for Ku Daeng

Unit:	Title	Process of Selection:
Thailand	Minister of Interior	Elected
Chiang Mai	Governor	Appointed directly by national capital
Sarapi	District Official	Appointed by Governor
Nong Fag	Kamnan	Elected by village headmen
Ku Daeng	Headman (2)	Elected by the villagers, both men and women

The provincial governor was appointed directly from the national capital. The district official, known as the Naj Ampur, was appointed by the provincial governor. These district officials were national government employees, and thus may have been transferred among the other districts, at the discretion of the provincial governor. This was the smallest administrative unit, which was controlled directly by the national government, via a trained and appointed group of officials.

The village administration was composed of the Kamnan and the headman. Each *moo* in Ku Daeng has a headman, who is elected by the *moo* residents. The village headmen are elected locally by the respective hamlets, by both men and women. The term of office was not fixed, and tends to be until death or retirement. The current headmen were elected to office between seven to eight years before this study was undertaken. One of the headman lived within the village all of his life, and the other lived in the village for about half his life. In terms of remuneration, the headmen receive a nominal fee from the government, they have some tax exemptions and are given the rank of government official, with the privilege of wearing a uniform (Kingshill, 1991).

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[7] The Kamnan is a village headman who had been elected by his fellow headmen within the commune. The Kamnan has many responsibilities, including being a liaison between the national government and the local population

In 1982, women were given the legal right to be village headman[8] and kamnan. By 1986, there were 16 women kamnan and 228 women heads of hamlets elected in approximately one thousand communes and almost ten thousand hamlets (Kingshill, 1991). Although the number is small in relation to the national totals, it still indicates that women are able to take over local administration (Soonthorndhada, 1992a).

To date, however, all the village heads of Ku Daeng have been male. This observation leads one to a number of questions. For example, what types of barriers are there to women's participation within the public sphere? What are the implications of a limited public role? Another question is whether this conscientization of women's abilities, as described by Soonthorndhada (1992a), has transcended through the rural population.

4.1.4.1.1 Village Development

In 1971, Ku Daeng was named a category A development site by the Minster of the Interior. Category A, meant that the village was open to change. The development of the village was achieved through the cooperative efforts of three groups: 1) three village committees, 2) government officials, and 3) the villagers themselves. Three committees were elected from among the villagers. The committees were: a village development committee, a social affairs committee (established a youth group, a small children's centre and an adult group), and an economic affairs committee (to oversee vocational matters and capital investment). The outcomes of the committees included agricultural improvements, home industry supports and infrastructure works (Kingshill, 1991).

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[8] In Thai, the actual term, *phuyaiban*, is gender neutral (Kingshill, 1991)

Currently, the village committees include: a women's group, a healthcare group, a youth group and an AIDS group. The women's group is involved in a number of different projects. There are about 45 women involved in this group. The village community development worker said that only about 15 women are involved in any given project at a given time. During the investigator's time there, the women were learning to sew as a means of income generation. The healthcare group (5 women) is involved in disease prevention and community health. They are also involved in a village cooperative pharmacy, which ensures affordable access to standard medications. There are 25 youth (between 15 and 25 years of age) involved in the youth group, which was established to provide leadership skills. The composition is half male and half female. The AIDS group, composed of about 15 members, is a new group that started about two years ago. Their role is to care for those with HIV.

4.1.4.2 Education

Traditionally, education was conducted within the temple by the monks, and thus was accessible only to males. Currently, a more formally structured national system is followed by Ku Daeng.

Since 1921, when primary education became compulsory, education within Ku Daeng has been co-educational. The village school offered four grades with any further schooling occurring outside the village. Since the 1950's there has been an increased demand for schooling beyond grade four. Preliminary statistics indicated that there were a higher number of female students in advanced levels of education, compared to male students. The 1990 statistics for females as a percent of total enrollment for Thailand, indicate that 81.4% of females are in primary school, 34.5% in secondary and 16.2% in tertiary (UNDP, 1995).

Since 1995, the village school in Ku Daeng has been closed down, due to a lack of children. A number of factors contributed to the closing of the school. Many parents felt that the education in the town was superior. With increased mobility and affluence, sending children to school in the town became both convenient and affordable. With increased affluence, parental responsibility to their children has shifted from providing food to providing education (Yoddumnern-Attig, 1992a). This is certainly evident within this village.

There is however a move by the headmen to re-establish the village school, starting with kindergarten. The hope is that offering incentives will encourage parents to view the village school as a viable option.

4.1.4.3 Religion

The religion in Ku Daeng is Buddhism. The Buddhist temple exists in the centre of the village in both a structural and functional sense. The villagers consider the holy writings as the Law. In some villages, the priest holds a leadership position in both religious and secular concerns. Within Ku Daeng though, the priest is viewed only as a religious leader. His status level is considered high with respect to prestige, but his role is confined to religious affairs.

Buddhism is said to embody a sense of "spiritual maleness" (Kingshill, 1965:74). Indeed the structure of the religion seems very male dominant on the surface. Because the investigator has very little knowledge about this particular religion, she did not feel it was appropriate to comment on this, merely raise it as an observation. In Ku Daeng, women took no active role in the official religious functions, though both men and women appeared to be equally active in temple affairs.

The other aspect of spirituality is the non-Buddhist aspect which covers the "supernatural" beliefs of the villagers, which have been passed down as customs. During the time the investigator was in the village, offerings were made to the spirits. On one occasion a villager appealed to the spirits through a mediator to help him overcome an illness. Two baskets filled with candles, rice, cigars, flowers, and other food items were offered to the spirits.

4.1.5 Cultural Values

Kingshill (1960; 1965) describes seven underlying cultural values that influence all actions and decisions made by the villagers of Ku Daeng. They are utility, profit, fun, individuality, communal responsibility, "do good, receive good", and play it safe. Some of these values are gesellschaft-like, whereas the others are geimenschaft-like. On which side the village as a whole would sit is difficult to ascertain. For example, on the occasion of the celebration of the King's jubilee anniversary of his ascension to the throne, a group of people participated in a clearing of the main road into the village. This involved clearing the grass along the ditch and sweeping the road.

4.1.6 Kinship and Family

Sulamith Potter (as cited in Yoddumnern-Attig, 1992a), described family life in Ku Daeng as being matrilineal and matrifocal, and thus a female-centered system. She states that there are four important principles: formal authority for men, juniors deferring to seniors, seniors assuming responsibility for welfare of juniors and lineal family relations

There is no specific locus seat of household authority. Women and men have authority over their respective sections of the household. In fact, the property rights within the family are similar to Western recognised rights. Individual members of family own their property and need not consult others with respect to additions to or disposal of their property. (Note: property in this sense is not restricted to real estate, it also includes material goods). The government, however, labels the husbands as the head of the household. The statistics in Table 4-3 reflect this based on 1953 data. Table 4-4, shows the current situation as described by the adult respondents (Group 4) in this study. A higher percentage of the land has shifted into female and joint ownership.

Table 4-3

1953 Land Ownership Patterns in Ku Daeng

Ownership	% of holdings
Males	72.5
Females	16.6
Joint	10.5

Table 4-4

Land Ownership Patterns as Stated by Group 4 Respondents

Ownership	% cited
Males	50.0
Females	34.1
Joint	15.9

There is a higher importance placed on "differences in age" than "differences in gender". This can be noted by the lack of gender specific terminology in Lanathai, versus Thai.

When addressing siblings, there are words for older sibling or younger sibling, but not for older male, nor older female. The same term is used for both.

Gender differentiation differs by community. Yet, there is less gender differentiation among those in Northern Thailand, than among the Thai in the central plains. According to Kingshill (1960), there is also less gendered role differentiation than many other villages, giving the impression that the work of both genders is valued.

There are however, some gender specific roles within the village. In Ku Daeng female tasks include: cleaning house, midwifery, general laundry; while male tasks include: barber, basketry, climbing tall trees, fishing with throw nets or traps, sewing and making nets, priest, temple committee, traditional doctor, undertaker. Neutral tasks (those tasks performed by either gender) are quite numerous they include: buying and selling land, caring for babies, cutting firewood, hoeing fields, ownership of land, riding bicycles, reaping rice and weeding rice fields.

4.1.7 Means and Methods of Making a Living:

The area of Chiang Mai, has a long history of agricultural development, which gave rise to a well established irrigation system and highly skilled farming products. Specialized products include vegetables, garlic, longan, onions, soybeans and fermented tea. In addition, there is also a well established cottage industry in handicrafts such as woodcarving, basketry, pottery and cotton fabrics (Israngkura & Chulasai, 1990). The predominant specializations in Ku Daeng are various vegetables, garlic, peanuts, longan (a fruit), soybeans, tobacco, fermented tea, handicrafts, basketry, and pottery. Historically animals, such as, buffalo, bullock, pigs, ducks, chickens, dogs, and cats were raised. Currently, there are only ducks, chickens, rabbits, dogs and cats.

The government imposed a heavy export tax on rice, which helped change the crop growing patterns, since then rice has been seen as a less profitable crop (World Bank, Sanittanont 1967 in Sirisambhand & Gordon, 1987). Most of the paddy fields within Ku Daeng have been converted into longan orchards. Many of the villagers are now tied to longans, which is less labour intensive than rice. The switch enabled the villagers to maintain two sources of income: income from longan orchard farming and income from another occupation (i.e. a being labourer). This change in income also facilitated the change in the village function. Many villagers now commute into town for work. They return in the evening, and thus in some respects Ku Daeng has become more of a bedroom community for those who commute.

4.1.8 *Social Changes:*

One of the challenges to Thai society of social change as mentioned by Kingshill (1965) is the Western influence with respect to gender differentiation. Many of the findings show that though there is some differentiation between the genders, there is still relatively little segregation when one compares it to Western gender differentiation. The question that this raises is the extent to which Western values will influence the current situation to change it to a less desirable state than currently exists.

One caution to note in regard to gender analysis and policy for a village like Ku Daeng, is that one must look at the inter-relations between different aspects and not just at each aspect individually, as presented above.

4.2 Description of Participants

There are four groups that participated in the formal interviews (see the overview in Table 3-1). The following are detailed descriptions of the participants within each group.

4.2.1 Group 1

Group 1 consisted of 12 children, between the ages of 6 and 12; 8 boys and 4 girls. Seven of the children were from *Moo* 6 and five from *Moo* 7. These 12 children represent 15.0% of the village population within this age range. All but one of these youth had lived in the village all their lives. The grades of the children are listed in Table 4-5. The schools they were attending are in Table 4-6. There was a fairly equal distribution across the different grades.

Table 4-5

Education of Children in Group 1

	Education (years)	# of respondents
Primary School:	1	1
	2	2
	3	1
	4	2
	5	2
	6	2
Secondary School:	7	1
n/a	0	1

Table 4-6

Schools Attended by Children in Group 1

School and Location	# of children
Walawan (approximately 3 km outside of Ku Daeng)	7
Nong Fag (next village, also name of tamboon)	1
Sarapi (in town, secondary school)	1
Schools in Chiang Mai (in city)	2

Since there is no longer a school within the village of Ku Daeng, all the students leave the village for all levels of schooling. Table 4-6 shows that the majority of the children interviewed attended Walawan school, though some also attended school within the commune, the nearest town (Sarapi) as well as the nearest city (Chiang Mai).

4.2.2 Group 2

Group 2 consisted of a total of 11 youth (14.3% of the youth population in the village); seven males and four females. All but one of the youths were a student, the exception being a labourer. There was a fairly equal distribution between the two hamlets. All but one of the youths lived in the village all their lives. This one youth had lived in the village for a year.

The age and educational breakdown of the students follows in Table 4-7 and Table 4-8, respectively:

Table 4-7

Age Breakdown of Group 2

Years of Age	No. of Youth
13	2
14	2
15	3
16	2
17	2

Table 4-8

Education of Group 2

Years in School	No. of Youth
7	1
8	2
9	2
10	4
11	2

4.2.3 Groups 3 and 4

Group 3 consisted of 70 women (15.6%[9] of the women in the village), whereas Group 4 (16.2% of the population in the village) consisted of 48 individuals. Since the age used to determine the sample overlapped between Groups 3 and 4, four women were interviewed as both Groups 3 and 4. This means that they were interviewed twice, however the overlapping section was omitted on the second round of interviews. These four women are listed separately within the tables, to avoid duplication. Table 4-9 outlines the demographic information for Groups 3 and 4, in terms of total number interviewed (n), gender breakdown, marital status and hamlet of residency (*Moo*).

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[9] There was a discrepancy between the household cards and the census data. It was deemed that the household cards would be more accurate and more conservative and so they were used to determine the total population of women within this group.

Table 4-9

Demographics of Groups 3 and 4

Group	n	Females	Males	Married	Single	*Moo* 6	*Moo* 7
3	66	66	n/a	57	9	29	37
3 and 4	4	4	n/a	4	1	2	2
4	42	16	26	41	1	19	23

The minimum level of education that was mandatory by 1977 was four years. This is reflected in that the majority of respondents had at least four years of education (see Table 4-10). In general, the educational levels were higher for the younger group.

Table 4-10

Education Level Attained for Groups 3 and 4

Years	Group 3	Group 4	In Groups 3 & 4
0	2	3	2
1-3	1	3	
4	46	34	2
5-6	4	1	
6-12	9	0	
>12	3	1	

Comparing age to the education for Group 3 reveals that the majority of the women had a grade 4 education level (refer to Table 4-11). Those that had a higher education level were under 40, though there was one woman in her 50's who had reached a secondary level and one woman in her 40's who reached a post-secondary level. Those that were in school less than four years were primarily over 60. Comparing age to education for Group 4, reveals that the majority of the individuals also had a grade four education level. It was difficult to ascertain if there were any patterns between age and education level for this group.

Table 4-11

Group 3 and 4 Age Groupings

Age	Group 3	Group 4	In Groups 3 & 4
high teens	1	n/a	n/a
twenties	5	n/a	n/a
thirties	30	n/a	n/a
forties	13	n/a	n/a
fifties	5	19	2
sixties	10	13	0
seventies	1	9	2
eighties	1	1	0

The totals column (T) in Table 4-12 shows the distribution of village residency of the individuals in Groups 3 and 4. This table, also shows that two thirds of the women in Group 3 lived in the village all their lives. Just over half (56%) of those in Group 4 lived in the village all their lives. There was a relatively equal distribution between the genders.

Table 4-12

Comparison of Age and Village Residency for Groups 3 and 4

Years	Group 3			Group 4			In Groups 3 & 4	
	=[10]	<[11]	Total	=	<	Total	=	<
0-10	0	8	8	0	3	3	0	1
11-20	1	5	6	0	1	1	0	0
21-30	3	2	5	0	2	2	0	0
31-40	24	3	27	0	6	6	0	0
41-50	5	0	5	0	5	5	0	0
51-60	5	1	6	9	1	10	1	1
61-70	7	0	7	9	0	9	0	0
71-80	1	1	2	6	1	7	1	0
Total	**46**	**20**	**66**	**24**	**19**	**43**	**2**	**2**

Many of the respondents were either longan orchard farmers or labourers, or both orchard farmers and labourers (refer to Table 4-13 and Table 4-14 for the occupations of Groups 3 and 4 respectively). One respondent in Group 3 listed three occupations, and six respondents listed two. Three male respondents in Group 4 listed 2 occupations (orchard and rice farming).

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[10] refers to those who lived within the village all their lives

[11] refers to those who came from another village

Table 4-13

Occupations of Group 3 Respondents

Occupation	Respondents[12]
rice farmer	2
farmer	4 (+1)
orchard farmer	13
general labourer	21
city labourer	1
skilled labourer at lampoon industrial park	1
construction worker	1
agricultural worker	1
school truck driver	1
teacher	1
accountant	1
nursing assistant	1
merchant	6
makes toy geckos	1
makes kat moo (a local snack)	1
hairdresser	2
dressmaker	6
housewife	6 (+2)
student	2
not working	1 (+1)

Table 4-14

Occupations of Group 4 Respondents

Occupations	Male	Females	Total
rice farmer	5		5
orchard farmer	14	6	21
vegetable farmer	1		1
general labourer	5	5	10
agricultural worker	1		1
teacher		1	1
merchant		1	1
housewife		3	5
not working		3	4

---

[12] those in brackets are in both groups 3 and 4

The average number of children of the respondents in Group 3 was 1.53 (refer to Figure 4-2). Having more than 3 children was observed only among those who were over the age of 50. In 1953, the average number of children was 5.3 (Kingshill, 1960), the current average as indicated by this sample, is less than half that.

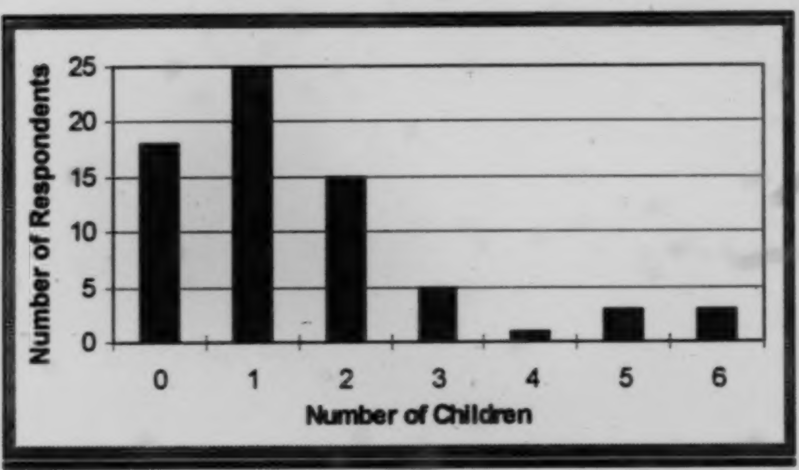

Figure 4-2: Number of children for Group 3 respondents.

4.2.4 Village Group Membership of Groups 2 and 3

Within Group 2: one youth belonged to the women's group, four belonged to the youth groups, whereas the remaining six did not belong to the youth group.

Within Group 3: one woman belonged to neither group, one belonged to the youth group, eight belonged to the women's group. The remaining 58 who responded to this survey said that they did not belong to the village women's group. Two women did not respond to this question.

4.3 Description of Views

The following section provides a summary of the results designed to address the three objectives of this study. The first section deals with environmental issues, the second with gender and the third with environmental education.

4.3.1 *Knowledge and Attitudes Towards Local Environmental Concerns.*

The first of the three objectives of this research study is to describe women's and their children's knowledge about and attitudes towards local environmental concerns. This section begins with an examination of general issues. These responses described are in relation to a variety of specific issues. A more detailed breakdown for selected issues will follow. It is important to look at how people view environmental issues as a whole, because this perspective gives the opportunity to see what the underlying values, assumptions and beliefs are before attempting to tackle any given issue. An understanding of these underlying attitudes helps to reflect upon what the best mode of environmental education might be. Each issue is subdivided by ***awareness***, ***attitude*** and ***action***. Within these subdivisions: women's awareness, children's and youth's awareness and a broad comparison between these two, will be addressed where information was obtained.

4.3.1.1 General Local Environmental Issues:

4.3.1.1.1 Awareness

The majority of participants (approx. 60%) identified at least one environmental issue, when asked to list local environmental issues. This shows that the majority of participants acknowledged the existence of environmental issues at the local level.

The types of issues that are raised by individual participants can be grouped into two large categories; those that dealt primarily with the natural environment and those that dealt with the social environment. The majority of participants provided between one to three issues. Considering the limited total number of issues uncovered by the collective group, this may indicate a low awareness. Part of the problem with this question is that many (35.7%) did not appear to understand how to define local environmental issues. This becomes evident by looking at the number of individuals who stated an important issue after being exposed to section B (the degree of awareness of environmental change) or in the case of a few who had to be revisited at a later date because of a change in procedure. Twenty-five women, roughly 35.7% of the sample in Group 3 changed their responses under these two scenarios. Those that changed their responses under the first scenarios listed the following types of issues as important: land, water (quality and quantity issues-including pollution, flooding and stagnant water) soil, mosquitoes, and animals. Notice how all these issues are natural environment issues. This shows the influence that section B had on the responses.

For those who changed their response under the second scenario, that of being revisited, the issues listed as most important were the following: waste disposal, water pollution, flooding and stagnant water. Considering that the remainder of the interview in the eyes of many focused on the waste disposal and water issues; this is not surprising. Both these examples confirm that the interview process influenced how these terms were defined.

The range of responses portrays the various ways in which the participants defined the environment. Roughly two thirds of the issues fit within the natural environment category, whereas one third of the issues fit within the social environment category. These numbers indicate in a way how the environment is viewed, for many see the term environment as the natural environment. Table 4-15 shows the issues that were raised by women and youth. The frequency of the issues (see Table C-1 in Appendix C), reflect the total number of times the issues was raised, as individuals could list more than one issue.

Table 4-15 and Figure 4-3 show that the issues that were most frequently raised were those dealing with water and with waste disposal. The specific issues for water included: floods and water pollution. The table in Appendix C (Table C-1) also shows which issues were not considered to be as important. Reasons for why certain issues were chosen over others may relate in some respect to the season. Water issues seem to be a primary target, reflecting perhaps, that interviews took place in the wet season, and flooding was a close threat. In fact there were days, when we were unable to reach potential interviewee's home because of flooding. Other suggestions why some issues were considered more important than others, can be found in the next subsection, entitled "attitude."

Table 4-15

Local Environmental Issues

Main Issue	Sub-Issue	Issues raised by: Youth	Issues raised by: Women
NATURAL ENVIRONMENT -			
Land:	less rice fields	*	*
Soil:	soil		*
Water:	water		*
	quantity of water		*
	floods	*	*
	drought		*
	quality of water		*
	water pollution	*	*
	water smells	*	*
Air/Temperature:	stagnant water	*	*
	air pollution		*
	hotter temperatures		*
	fluctuating temperatures		*
Flora/Fauna:	deforestation	*	*
	weeds/grass		*
	fauna		
	mosquitoes		*
	stray dogs		*
	fish		*
SOCIAL ENVIRONMENT -			
	bad roads	*	*
	too many cars		*
	insufficient electricity		*
	waste disposal	*	*
	drugs	*	

* indicates that issue was raised

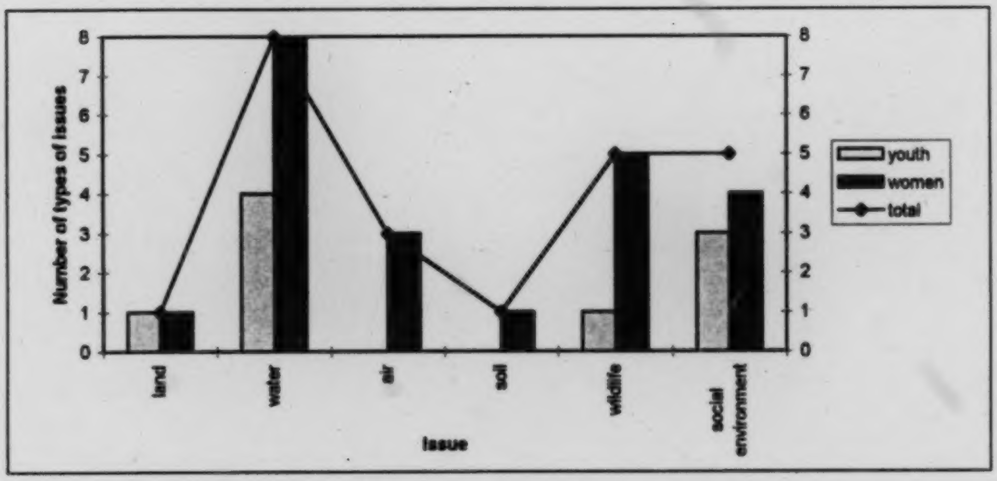

Figure 4-3: Types of issues raised by women and youth.

In order to increase the reliability, each of the issues was addressed from at least two different perspectives. One was through the use of photographs. Appendix C shows the range of responses with respect to whether the photo was seen as positive or negative. Some felt that there were both positive and negative elements.

4.3.1.1.1.1 SOLVING THE ISSUES RAISED

When asked in the first question how environmental issues could be solved, many of the respondents listed approaches. This indicates that in general, the issues were perceived as being solvable. About 83% felt that the issues were solvable; the rest stated that it was either un-solvable or that they did not know of how it could be solved. Among those who offered solutions there was a balance between those who solved things after the fact (reactive), and those who would stress proactive (preventative) measures. When dealing with environmental issues, it is refreshing to see that this balance exists, and that proactive measures are not forgotten or ignored. Listing proactive measures, goes a step further than merely dealing with issues, it required anticipatory consideration.

Responses to the issues presented in the photos raised similar solutions. Most of the solutions listed for these different issues were reactive. This may be a reflection of the limited number of issues covered within the photos. Refer to Appendix C.3 for a more extensive presentation of the photo responses.

4.3.1.1.1.2 ATTENTION TO CHANGES IN THE ENVIRONMENT

This section was used to determine how the natural environment of the village was perceived to have changed within the lifetime of the respondent. In order to work around potential limitations discussed in chapter 3 regarding definitions of the term "environment", the focus in this analysis was based on the "natural environment" rather than encompassing the holistic definition of the term. Thus, the social environment is excluded from this portion of the analysis.

The questions that were used in this analysis were modified from a study completed in Northern Thailand by Wouters (1996). In her study, all the respondents indicated that changes had occurred in the environment. Most respondents indicated that the time frame in which this awareness of change occurred was within one to ten years. In order to further refine the methodology used in that study, when asking a similar question about changes in the natural environment, there was the addition of a "when noticed" for every component.

The nature of the data lent themselves to statistical analysis. This particular analysis is based on one assumption. Since the natural environment is constantly changing, one should always be able to find some way in which it has changed. Thus, an individual who notices a change more recently is more attune with the environment than a person who noticed the change further in the past.

The following was the equation used.

Degree of Attention to Changes in the Natural Environment =

$$\alpha + \beta_1(\text{educational level}) + \beta_2(\text{age grouping}) + \beta_3(\text{agricultural occupation}) + \beta_4(\text{occupational status}) + \beta_5(\text{marital status}) + \beta_6(\text{number of children}) + \beta_7(\textit{moo}) + \beta_8(\text{length of time in the village}) + \varepsilon$$

All the variables were examined through multiple linear regression. The focus of this study however, was to predict the direction of change, rather than the predictive capacity of the equation. For a description of the variables used in the linear regression refer to Appendix C-2.

The initial interview schedule question was initially used to determine how the natural environment of the village was perceived to have changed. The collective data (Table 4-16) shows that overall availability of water, water quality in the canal, amount of plants and amount of animals were felt to have changed by a greater number of respondents. Water and soil issues were believed to have worsened, whereas plant and animals were seen to have decreased in quantity. The time frame used aids in determining if there are consistencies about when major changes were viewed. Table 4-17 indicates that most of the changes were felt to have occurred within the last ten years. Since things change constantly within the environment, the number of indications that change had occurred and the interval in which it was noticed indicate an awareness of their surroundings. Those who noticed changes more recently in a larger number of areas, were considered to be more attuned to their local environment. In the previous study conducted by Wouters (1996), all the respondents indicated that changes had occurred with water quality and quantity. These responses are different than in the village studied for this analysis (Wouters, 1996), however, the question was also more specific in that it related to water quality at home, and in the canal separately. In the case of water quality at home, the raw data shows that 46% of the women felt that changes had occurred in the water quality at home and 54% felt that it had not changed. Of those who felt that changes had occurred, 29 felt that it was for the worse and 7 indicated that the change was for the better. Two individuals noticed the change within the last year, 27 within the last 1-5 years, 3 within the last 6-10 years, 3 within the last 11-20 years and 2 greater than 20 years (refer to Table 4-17).

Table 4-16

Changes in the Natural Environment

Change in:	yes (%)	no (%)	less	more	better	worse	all/none of above
availability of water	53	47	7	3	12	22	
water cleanness at home	46	54	0	0	7	29	1
water cleanness in canal	74	26	11	2	7	47	1
soil productivity at home	25	73	1	0	4	15	
soil productivity in field or orchard	38	52	0	0	4	20	7
air cleanness	16	84	0	0	0	13	
amount of plants	67	32	40	9	2	0	4
kinds of plants	51	49	30	9	0	1	1
amount of animals	84	16	59	7	0	1	1
kinds of animals	64	35	45	5	1	1	

Table 4-17

When Changes in the Natural Environment Were Noticed

Change in:	within the year	1-5 years	6-10 years	11-20 years	> 20 years
availability of water	3	29	7	3	1
water cleanness at home	2	27	3	3	2
water cleanness in canal	2	45	4	5	2
soil productivity at home		11	6	2	
soil productivity in field/orchard		21	6	2	1
air cleanness		8	3	1	
amount of plants	2	42	8	1	1
kinds of plants	1	30	10		
amount of animals	1	42	23	2	
kinds of animals		37	12	2	1

Based on the multiple linear regression, the relatively low R^2 (see Table 4-18) values indicate that the equation has a fairly low predictive function. Considering that this was a qualitative study with relatively few respondents, not initially designed to be statistically analysed, that in itself is not surprising. For this reason the results should be interpreted with caution and interpreted as trends only. In comparison to each other, the independent variables examined appear to have the greatest predictive capabilities for the following dependent variables: water quality (approximately 22-23.7%), soil productivity at home (22.6%), and the kinds of animals (22.3%).

Table 4-18

Predictive Value(R^2) and Sig T of Independent Variables on Dependent Variable.

Dependent Variables	n	R^2	Significant T if less than 0.10						
			Marital status	Age group	Level of education attained	Agricultural occupation	*moo*	Occupational status	Village residency
water: availability	67	0.155		0.019		0.035		0.068	
water quality in canal	67	0.237		0.065			0.020		
water quality at home	67	0.220	0.020		0.101	0.047			0.087
soil in field or orchard	60	0.161					0.026		
soil at home	66	0.226		0.020		0.085		0.020	
air	67	0.092			0.054				
kinds of plants	67	0.117					0.102		
amount of plants	66	0.134							
kinds of animals	67	0.223						0.009	0.077
amount of animals	67	0.179					0.036		

The individual dependent variables produced different R^2. This shows that the independent variables have varying strengths of influence on the different variables. The different significant T's also show that varying combinations of the independent variables are required to predict the dependent variables, and that they do so to differing degrees. Using the conventional significance of 0.05, the following hold true:

- for water availability, age and agricultural occupation were significant influences

- for water quality in the canal; soil productivity in the field/orchard, and the amounts of animals, only the *moo* of residence was a significant factor

- for water quality at home, however, marital status and agricultural occupation were the most influential factors.

- changes in the soil productivity at home could be most accurately predicted through occupational status and age, than from the other factors considered

- awareness of air quality was most highly predicted by the level of education and

- the changes in kinds of animals predicted by occupational status.

Since a directional hypothesis was used in this study and formal predictions about the directions were made previously, a less conservative criterion of 0.10[13] could also be applied. Doing so reveals the following additions to the previous statements:

- for water availability, occupational status can be added to the other two factors (age and agricultural occupations,
- whether water quality in the canal changed; it is also significantly influenced by the age of the respondent,
- the level of education and the village residency were two additional influences on the quality of water at home, bringing the total number of predicting factors up to four,
- soil productivity changes at home is also predicted by agricultural occupation,
- changes in the kinds of plants can be most predicted by *moo* of residence,
- changes in the kinds of animals can also be predicted by the time in the village.

Looking more closely at the data from the regression for each of the dependent variables reveals that selected factors influence the dependent variables in different ways (see Table 4-19). For example with age, the younger you are the more attuned to changes in the natural environment for factors other than soil. This may reflect an older population having more ties to the soil and perhaps a younger population which commutes outside the village.

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[13] since significant T's of 0.101 and 0.102 are so close to 0.10, they too are considered to be within the 0.10 cut-off point.

Table 4-19:

Actual Direction of Influence of Independent Variables on Dependent Variable.

Dependent Variables	age	agricultural occupation	# of children	level of education attained	moo	marital status	occupational status	village residency
water: availability	+	-	-	+	-	+	+	-
water quality in canal	+	-	-	-	-	-	-	-
water quality at home	+	+	-	+	+	+	-	-
soil in field or orchard	-	+	+	-	+	+	-	-
soil at home	-	+	+	-	+	+	-	-
air	+	-	+	-	+	-	+	-
kinds of plants	+	-	+	+	-	+	-	+
amount of plants	+	-	-	-	-	-	-	+
kinds of animals	+	+	-	+	-	+	-	-
amount of animals	+	-	+	-	-	-	-	-

There are a number of limitations in using regression analysis in the study based on the method used, the data, and the variables. Limitations of the data and variables are discussed at the end of Appendix C.2. Some of the limitations of the methods used include:

- the sample size was small,
- the study was designed primarily as a qualitative one.
- collinearity diagnostics and coefficient correlations (Table C-7 in Appendix C.2) revealed that there was multicolinearity between two pairs of variables: occupational status and agricultural occupation, as well as time in the village and the age of the respondent. These, however, were left in the analysis for reasons disclosed under limitations of the variables used (in Appendix C.2).
- Factors such as income or socio-economic status were not included as they were not effective means of gathering the information without jeopardizing the more important aspects of the study.

Though the equation was not a model to describe all the factors that influences a person's ability to notice changes in the local natural environment, it allowed for some descriptive information about the sample to be generated. The difference between regression with the various dependent variables shows that there are differences in what changes are noticed by individuals.

4.3.1.1.2 Attitude

This section on environmental *attitude* is presented in terms of values and responsibilities.

Responses as to why issues stated were considered the most important ranged from reasons of aesthetics to reasons of loss of income. Table 4-20 provided as extensive list of the reasons that were listed and the number of times each was listed.

Table 4-20

Reasons Why Issues are the Most Important to Respondents

	Reason	Group 2	Group 3	Total	Sub-category Totals
mobility		2	8	10	13
	• access		1	1	
	• convenience		2	2	
health			2	2	7
	• humans		4	4	
	• animals	1		1	
economic	• utility	3	11	14	28
	• income loss		11	11	
	• convenience		1	1	
	• cost		2	2	
aesthetic	• sight		7	7	13
	• smell	4	2	6	
power/ control	• uncontrollable		7	7	17
	• external cause		4	4	
	• reoccurring		3	3	
	• careless people		1	1	
	• technology		2	2	
misc.	• miscellaneous				
	• forced to act in undesirable way	2	3	5	
	• cumulative effects		2	2	
do not know/not stated				9	

Some individuals (total of 12) listed two reasons. Reasons that proved to be the most common included: economic, mobility, aesthetic and lack of power or control. The reasons indicated also show what types of things the participants value. For example, by giving reasons like utility and economic loss, the respondents value was seen as being economic, by mentioning sight and smell, aesthetics seemed to be valued. Factors that appear to have the least frequency of occurrence include health (especially with respect to animal health), careless people and technology.

The most important reasons that resulted from the use of the photos were (in order of importance): sight, human health, smell, and animal health. Considering this finding in conjunction with the information from the previous table this would imply that the two most important values were placed on aesthetics and human health: other values including safety and the heath of animals and plants were next in importance.

The responses to the query about who should be involved in solving the issues indicates where the responsibility lies in the eyes of the participants. Around 13 individuals gave two responses, the most common combination being the headman and the villagers. The following table (Table 4-21) indicates who was seen as responsible.

Table 4-21

Who Should be Responsible for Solving Environmental Issues?

	Group 2	Group 3	Total
No one		3	3
I should (personal)	1	5	6
family	1	4	5
headman	3	24	31
village	1	10	11
outside the village	1	8	9
everyone	6	15	21
someone with power		1	1
do not know		1	1

The following choices were reported: Out of 81 valid responses (7 were n/a since this was a contingency question): 6 indicated personal responsibility, 31 felt that it was the headman's responsibility, 9 felt that responsibility should go to others outside of the village, and 1 felt that she did not know who should be responsible. The fact that such a large number of people felt that it was the responsibility of the headman, reflects the culture (which tends to be very hierarchical), and that personal responsibility does not hold as much weight. The implications of this for environmental education is that the headman needs to take a central role in at least initiating all solutions. In addition, it suggests that there needs to be an increase in the individuals' role.

With respect to the environmental issues reflected in the photos, the question was posed as what should you do, rather than who should do something. Most of the respondents answered this question. A few still indicated that other people must take a role. The most common responses were "the headman" and "everyone".

4.3.1.1.3 Action

Asking why issues exist, indirectly reveals perceived barriers to change. Barriers in order of importance (based on total frequencies) include: a sense of responsibility or ownership, lack of sufficient knowledge base or lack of education, convenience, time, lack of resources, control (both manmade and natural), alternatives are worse - bringing on a feeling that the status quo is a necessary evil.

4.3.1.2 Water Issues:

4.3.1.2.1 Awareness

The following is a list of the types of things that the respondents felt contributed to a polluted water supply:

- stagnant water, soil erosion, carcasses, flood, weeds, grass, leaves, rain (potentially natural causes),
- upstream, industry or factory (factors external to the village),
- garbage, dish washing soap, chemicals (factors internal to the village),
- nothing,
- not stated.

The most popular responses for the women and youth were: garbage; industry or factory; weeds, grass, or leaves; nothing. Very few people linked chemicals (such as herbicides) as the cause of a polluted water supply. Yet, observation in the village of herbicide spraying would suggest that this could be potentially a very important cause. Refer to Appendix C.3.1 for a more extensive discussion of the reaction to herbicides.

4.3.1.2.2 Attitude

Figure 4-4 shows that health is the most valued aspect of a clean water supply: health included uses such as drinking and food supply (i.e. fish). The least mentioned reason were financial and environmental. An example of a financial reason was to "reduce cost to family, as then don't need to buy water to drink (3:61)", and an example of an environmental reason is "makes everything good, the environment, self family, everything is good if water is cleaner (3:33)". This shows that financial incentives might not be the most powerful incentive to maintain a clean water supply. The low value of the environment per se suggests that human factors have a considerable weight, and that if the human angle is not adequately portrayed, the environment on its own may not be a sufficient reason to motivate people to live sustainably.

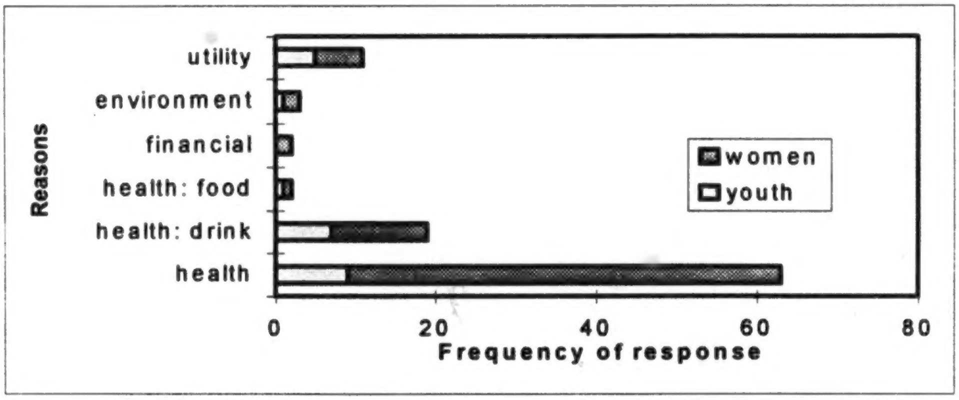

Figure 4-4: Why clean water was deemed important by the women and youth respondents.

4.3.1.2.3 Action

The large number of respondents claimed that no one made the water dirty. This shows that there was little awareness or recognition of the contribution that everyone makes towards making the water supply dirty. Figure 4-5 shows this most clearly. There was little recognition of the personal human influence on water quality, though at least 15% did make note of this relationship. A higher percentage of the youth's responses relative to those of the women, reveals an acknowledgment of everyone's role in making the water dirty.

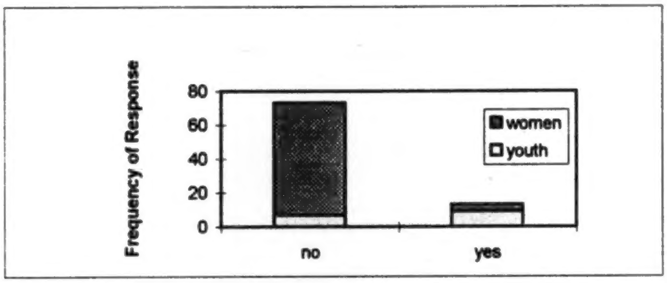

Figure 4-5: Do you or your family make the water dirty?

When asked what they do to keep the water supply clean, a number of responses were given. For those who stated a particular action, they were coded as to whether the act was a proactive or a reactive measure. The following table (Table 4-22) gives the responses:

Table 4-22

How Water is Kept Clean

	Group 2	Group 3	Total	Examples
Nothing	5	26	**31**	• no, don't have time (3:72) • nothing, only men do that work (pulling weeds and taking garbage out of canal), not women (3:23)
Something			**54**	
proactive	6	22	28	• by not throwing garbage in the canal (2:2)
reactive	4	15	19	• help the members of the village clean up (3:80)
both of above	1	6	7	• by not throwing trash into the canals, when have meeting to clean up the canal, I do (3:32)

Of the 31 that said nothing, a few gave reasons. One individual stated that they did not make the water dirty, four individuals stated that they were busy or had no time, two individuals stated that they did not because it was man's work. One individual stated that sometimes they did something and sometimes they did not; however, they did not clarify what was done, thus their response was not included in the above table.

Of the 19 responses that were reactive: five of them were "by taking part in community cleanups". This response is indicative of group rather than individual action. Appendix C.3.2 provides another example of how water quality was viewed.

4.3.1.3 Mineral[14] Fertilizer Issue:

4.3.1.3.1 Awareness

From the responses it appeared that many people seemed to have interpreted "when mineral fertilizers are harmful" to read "why are mineral fertilizers harmful." Each of these responses has been coded under two variables. Of those who interpreted the question as "when", ten felt that it was through the use of too much mineral fertilizer that harm resulted, one felt that it was when it was used incorrectly. These two responses may have comparable meaning, or they could be interpreted differently which is why they have been left as separate responses.

The majority of the sample gave responses dealing with the "why?". The answers ranged from those dealing with the soil to those dealing with health aspects. Examples of the types of issues that dealt with soil include: quality of soil declines, becomes hard, salty, another is that fertilizers are persistent (do not go away). The coded responses are included inTable 4-23.

The responses tell something about the values held by the respondents. The increasing quantity of plant biomass produced is the most common reason for using mineral fertilizers (Table 4-24). Considering that this is a primarily agricultural community, the focus on productivity makes sense. The question that this raises, however, is whether they feel that the harmful consequences compensate for the benefits?

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[14] Since all fertilizers are chemical, it is more appropriate to refer to synthetic fertilizers as mineral fertilizers rather than chemical (environmental views).

Table 4-23

Reasons Why Mineral Fertilizers are Harmful

	youth	women	total	examples of types of issues
Soil:	4	17	21	• makes soil structure bad (3:5)
Health:				• is poisonous (3:19) • stings the skin (3:20) • if chemical leaks down to water, kills fish and living things in the water (3:53) • makes plants become weak, catch disease easily (3:34)
general		2	2	
humans	1	7	8	
living water and/or soil organisms	2	3	5	
plants	1	12	13	
It says it's harmful on the pkg.		1	1	• there's a danger sign on the fertilizer bag (3:47)
Do not know what is in it		1	1	• chemical things in it, don't know what it is (3:13)
No harm	2	12	14	
Do not know	1	13	14	
n/a			2	

Table 4-24

Reasons Why Mineral Fertilizers are Useful

	Group 2	Group 3	Total
production		2	2
soil		3	3
plant quantity	14	50	64
plant quality	2	6	8
convenience (easy to use)		1	1
no use		2	2
others use it		1	1
do not know		5	5

Table 4-25 shows that of those 77 individuals who believed that the use of mineral fertilizers enhanced productivity: 27% felt that it harmed the soil, 23.4% felt that it was detrimental to the health of water/soil organisms or plants, 10.4% health of humans, 19.5% felt that is was not harmful and 14.3% did not know what the harm was.

Table 4-25

Acknowledgment of Tradeoffs Between Harm and Use of Mineral Fertilizers

	productivity	convenient	no use	do not know	others use it
Soil:	**21**	1	1		
Health:				1	
general	2				
humans	**18**				
water/soil organisms or plants	8				
It says it's harmful on the pkg.	1				
Do not know what is in it	1				
No harm:	**15**				
Do not know	**11**		1	2	1
n/a				2	

Two individuals knew neither the uses nor the harms of mineral fertilizers. One individual stated that they did not know what the harm was, but that mineral fertilizer was useful because others used it. Two individuals felt there was no use for mineral fertilizers: one of which did not know how it was harmful and the other felt that it was harmful for the soil.

4.3.1.3.2 Action

Mineral fertilizers are mostly used in the orchard, which was the primary occupation/source of income (See Table 4-26). Considering that productivity was cited by many as the reason why fertilizers were useful, this finding is logical (refer back to Table 4-24). Over half the respondents either do not use mineral fertilizers or use organic fertilizers within their house compounds. The "n/a's" show the relative amount of land use in the village. Almost all the respondents had land on which to grow things within their house compound, less than 20% had no orchard, yet few people have fields left. Less than 10% of the respondents had fields.

Table 4-26

Women's Response to Where they Use Fertilizer

	House Compound	Orchard	Field
Use mineral fertilizer	28	**53**	2
Never/organic	**36**	5	3
n/a	5	12	**65**

Table 4-27 shows that those who feel that mineral fertilizers are useful for productivity tended to use it within their orchards once a year. But within their home compounds, some would use it once a year, but many more would either not use it or use organic fertilizer instead. Four individuals claimed that there was no use for mineral fertilizers yet they used it within their orchard. Of the four individuals who did not know the use, two still used it within their orchard and two others within their homes. For a related topic, refer to the discussion on organic fertilizers in Appendix C.3.3.

Table 4-27

Comparison of Women's Understanding of Mineral Fertilizer Use and Usefulness

	Production			Convenience			No use			Do not know			Other's use		
	f	h	o	f	h	o	f	h	o	f	h	o	f	h	o
week		1													
month		1	1												
year	2	21	47		1	1			4		2	2			
never/organic	2	34	5							1	2				
n/a	57	2	8	1			2			4	1	3	1	1	1
sometimes		1													

4.3.1.4 Cooking Fuel Source Issue:

It has been shown in the section on gender roles (see section 4.3.1.2) that within this village women are responsible for the household cooking. Thus, it was deemed appropriate to gain a better understanding of what fuel source was used and what reasons were used for choosing one over another.

The most common and most frequent cooking method is gas, followed by wood (See Table 4-28). For this question there was one missing case, the woman said she no longer cooked, thus did not feel she should answer.

Table 4-28

Frequency With Which a Specific Energy Source was Used by the Women for Cooking

	charcoal	gas	wood	electric
at least once/day	9	**52**	**37**	13
at least once/week	3	7	6	7
at least once/month	9	1	5	13
occasionally		1		1
Never	**48**	8	21	**35**

4.3.1.4.1 Attitude

Convenience with respect to ease and time was the most common reason listed for choosing gas as the best fuel(refer to Table 4-29). Convenience in terms of easily accessible and the belief that better flavoured food resulted from wood, were the most common responses for those who felt that wood was the best fuel.

Table 4-29

Women's Reasons for Cooking with a Particular Energy Source

Reason why it is the best	charcoal	gas	wood	electric
convenience		4		
clean		1		
easy		**35**	1	2
fast(time)		**22**		2
used to it			2	
easily accessible			**5**	
money	1	3		
smell			1	
better food	2		**5**	
safe	1	2	2	
energy (holds heat longer)	2		2	
TOTALS who chose as best:	6	42	17	3

(Note: 32 women gave multiple reasons)

4.3.1.5 Waste Disposal Issues:

4.3.1.5.1 Awareness

Most of the respondents felt that waste disposal was not an issue within Ku Daeng (see Table 4-30). This is interesting because when asked to list local environmental issues, waste disposal issues was one of the issues that came up frequently. This can be interpreted to mean that though waste disposal was seen as important when compared to many other issues, when taken on its own, it was not viewed as important.

Table 4-30

Whether Waste Disposal was a Problem and Reasons Given to Explain the Stated Opinion

	Is waste disposal a problem?					
	No			Yes		
Reasons given	Youth	Women	Total	Youth	Women	Total
land space:		1	1	1		1
little					8	8
go to city					1	1
lots		6	6			
lots of garbage					2	2
a little garbage	1	3	4			
households deal with it	1	11	12		1	1
put in a hole	3	10	13	1		1
by burning	1	21	22		3	3
smell				1	2	3
sight					1	1
people's behaviour				1	3	5
not stated	1	3	4			
TOTAL	7	57	64	5	19	24

The majority of those who felt that waste disposal was not a problem within Ku Daeng felt that it was not problematic, since it was dealt with on a household level, for example by burning or burying it Other reasons included that there was a lots of land or very little garbage. Those that felt that waste disposal was a problem within the village gave the following types of reasons:

- no specific place to throw away, just throw anywhere (2:1)
- not enough place to dump it (3:72)
- people gather garbage in home and throw it in the city rather than at home (3:27)
- too much garbage would smell (3:69)
- have problem because some houses need to burn garbage together (3:71)
- because it smells when we burn it (3:22)
- people throw their garbage everywhere rather than in a certain place (3:62)

Refer to Appendix C.3.4 and C.3.5 for a discussion of the related issues of a makeshift common land dump and burning garbage, respectively.

No youth felt that there were positive or neutral results when plastic was left in the soil, though there was one that did not know what would happen (refer to Table 4-31). Overall, there was an awareness that leaving plastic in the soil had negative consequences. A few of the women were misinformed, for example thinking that there was either no consequences or that fertilizer could result from plastic. One woman said that it was good to leave plastic in the soil but that she had never tried it.

Table 4-31

What Happens When Plastic is Left in the Soil

	Positive/neutral			Negative		
	Youth	Women	Total	Youth	Women	Total
does not decompose/degrade				9	45	55
soil bad/plants do not grow				1	11	19
water polluted					2	2
fertilizer		4	4			
other methods of disposal worse					1	1
nothing/no problem		4	4			
do not know				1		

(12 individuals: one Group 2 & eleven Group 3's gave > one response)

About half the youth were able to list three ways to reduce waste, whereas the women were only able to list one if any (see Table 4-32). About 30% of the women were able to list at least one way. The most common response was the recycle, reduce or sell. Though women also listed: decreasing consumption, using as fertilizer and having the government pick it up as potential solutions (refer to Table C-2 in Appendix C.1). For a related discussion, also refer to Appendix C.3,for the photo reactions on separating garbage (in Appendix C.3.6) and empty herbicide bottles in the orchard (in Appendix C.3.7).

Table 4-32

Number of Ways Listed to Reduce Waste that Gets Burned, Dumped or Buried

	Youth	Women	Total
None	2	48	50
One	4	22	26
Two	5		5
TOTAL	11	70	81

4.3.1.5.2 Attitude/ Action

About two thirds of the respondents felt that it was important to reduce the amount of waste that was produced (refer to Table 4-33).

Table 4-33

Whether Waste Produced Should be Reduced

	Youth	Women	Total
yes	10	43	53
no	1	26	27
TOTAL	11	69	80

Examples of reasons why the respondents felt that it was important to reduce waste include:

- too much as time goes on, it accumulates ,"becomes more and more" (2:1)
- because amount of garbage increases everyday (3:71)

- because there's more and more everyday, it seems to never become less, if could make some way, it would be good (3:64)

- not a lot of it now, but if don't reduce now, will be a problem in the future (3:56)

- there's a lots of it, have to reduce it (3:67)

- because if use a lot, need to destroy more (3:79)

- if a lot it would be hard to destroy (3:74)

- in the future I'm afraid there won't be anymore places to bury garbage (2:4)

- no place to throw it. If I buy at the mini-mart, I'm given 3-4 bags, when I only want one (3:12)

- to reduce air pollution in everyday life (2:9)

- when burn a lot of garbage, it would affect the air a lot (3:45)

- make environment become better (2:6)

- if don't then makes environment bad (2:9)

- if lots then the village would smell (3:2)

- if use a lot it would be a mess (3:20)

- because not beautiful if have a lot (3:80)

- not sure of why (3:1)

- necessary for living (3:72)

- if don't have a lot then can destroy all of it and by not taking garbage home (3:16)

- garbage would be lots, is host(habitat/breeding ground) for insects (3:21)

- necessary as everything that you buy generates garbage (3:15)

- not enough area to burn, so should decrease the quantity of garbage (3:29)

- because have no time to deal with garbage, have to reduce it (3:50)

Some examples why reducing waste was not deemed important include:

- not necessary because use everyday (2:7)
- there is lots of empty land left (3:4)
- people have their own garbage hole (3:61)
- because every house can burn, no problem (3:22)
- because not a lot of it (3:9)
- people destroy their own garbage (3:73)
- don't have too much (3:52)
- because in village don't have much garbage (3:78)
- not necessary, because cannot be reduced (3:44)
- dump in hole underground therefore safer (2:3)
- no need, because they could reuse it, plastic and foam (3:28)

For the most part, those who felt that waste disposal was a problem also felt that reducing the amount of waste was a solution, whereas those who did not see waste disposal as a problem, did not think they should reduce waste. There were five individuals, however, who felt that waste disposal was a problem, but that decreasing the amount of waste produced, was not the way to solve it (refer to Table 4-34).

Table 4-34

The Relationship Between Reducing Waste and Viewing Waste Disposal as a Concern

Waste disposal is a problem	We should reduce waste			
	Yes		No	
	Youth	Women	Youth	Women
No	6	31	1	21
Yes	4	12		5

4.3.2 Gender Issues

The second of the three objectives of this research study was to examine gender roles and attitudes within the village of Ku Daeng, specifically focusing on women. This objective was not designed to give a complete understanding of women within Ku Daeng. The intent was merely to give a general overview of some of the attitudes towards women, including women's own views and attitudes. There are a number of approaches that an assessment of this nature could take. The assessment in this study was based on secondary sources such as Kingshill's research (Kingshill, 1991) to reflect the historical context, observations made within the village and the interview schedules for both Groups 3 and 4. In addition, the informal interviews with the headman and monk were used. Longwe (1991) indicates that when doing gender analysis, one must look at issues from the following perspectives: welfare, access, conscientisation, participation and control. This study used this breakdown in the four sections which follow.

It is important to note that gender analysis was not the sole focus of this study. Consequently, the issues that were examined were selected based on if they would have a potential bearing on women's environmental education assessment.

4.3.2.1 Welfare

Looking at the overall well-being of women relative to men, in terms of food, shelter, clothing, and health, reveals an equality on this level. Within the village, the investigator did not observe any major differences on this front. The village development projects have contributed to increasing the material welfare of both men and women (Kingshill, 1991). Poverty as one of the reasons listed for unsustainable choices in Caring for the Environment: A Strategy for Sustainable Living (IUCN, UNEP, & WWFN, 1990) would thus be irrelevant within the general context of this particular village. What this raises instead is the cumulative impact of material consumption, and whether the consumptive patterns of men and women differ to a degree where one is seen as having a more disruptive influence in the creating of sustainable societies. This was not a focus of this study, but the unique position of this village in terms of its level of economic growth and social development, suggests that it should be a focus of subsequent studies.

4.3.2.2 Access

The second area that was investigated was "access". Access in terms of time, money, land, and politics were the main areas of focus.

Rural Thai women have fewer access to opportunities than their urban counterparts. Time often acts as a barrier for rural women. In rural areas women perform two roles at the same time: agricultural and household management work, and it is difficult to separate the economic activity from the unpaid contribution (Soonthorndhada, 1992b). Their workload makes it difficult to spare time for any type of training or education in the broadest sense. (Soonthorndhada, 1992c).

One means of assessing whether time acts as a barrier for women was to ask them if they had personal time in the evening. Over one third of the women stated that they did not have personal time in the evenings. Just under two thirds, stated that they had. This shows that for the majority of the women, time was not considered as a barrier. For the one third where it could be deemed a barrier, a variety of factors were listed as preventing them from having free time in the evenings. Cooking and working were listed the most number of times (refer to Table 4-35). More than half of the reasons were related to gendered roles (i.e. cooking, cleaning, laundry, taking care of children). This suggests that these gendered tasks did impinge on women's free time. It is important to note that while each village has a different gender role allocation (Kingshill, 1960), this analysis was completed according to the one established in the village of Ku Daeng. However, it is also important to note that there are limitations to the way in which this question was asked. The question assumed that personal time would only be in the evenings, yet this depended upon each woman's schedule. Some of the women were more likely to have personal time at another part of the day. The following women are two examples:

- I work from 6 pm to 6 am (labourer- 24 years of age)
- I am busy at work (hairdresser- 40 years of age)

Examples of "other" include:

- I would not know what to do if I had spare time, so I always keep busy (farmer-38 years of age)

- I do other "little things"(labourer-48 years of age)
- only at certain times (labourer-35 years of age).

Table 4-35

Factors Influencing Lack of Personal Time for Group 3

Factors	Frequency
Not applicable	42
Cooking	14
Working	11
Farming/gardening	4
Cleaning	2
Laundry	2
Value adding of agricultural products	2
Taking care of (children, ill husband etc…)	1
Special circumstances	1
Other	3
Combination of above reasons	10

Access to land and money were another area of focus. Rural Thai women are not the official household head, yet they played a key role in household management, especially with respect to economic matters - often serving as both the family treasurer and financial manager (Yoddumnern-Attig, 1992b). This was true of the respondents in this study. With respect to land however, more men own land than women. Refer to Figure 4-6, for the gender distribution of keeping money and owning land.

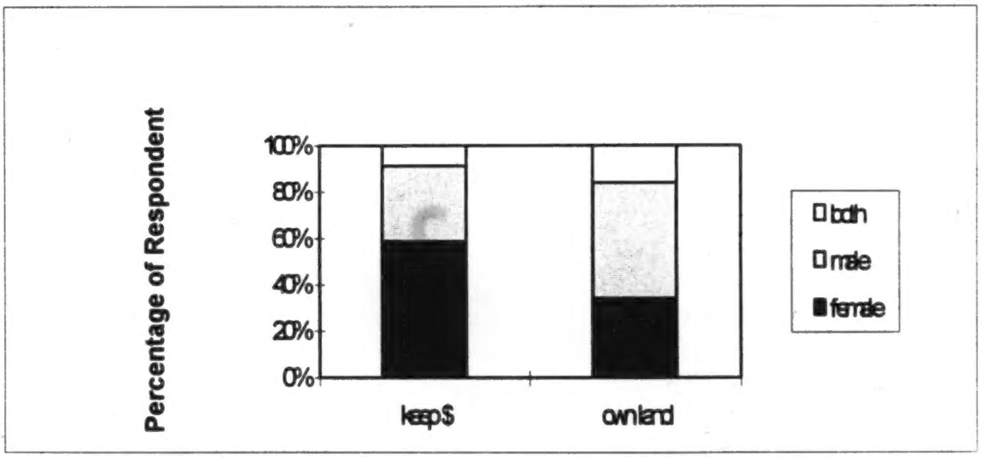

Figure 4-6: Gender distribution of keeping money and owning land.

When one further analyzes the distribution, one finds that between 37-43% of both female and male respondents stated that they kept the money or owned the land, and 20-28% stated that it was their spouse. For other families, the money is kept by the child, both husband and wife, grandchildren, parents or grandparents, from highest frequency to lowest. Land, however, is owned by both husband and wife, parents, children, grandchildren or grandparents. Table 4-36 shows the gender distribution between keeping money and owning land.

Table 4-36

Who Keeps Money and Who Owns Land

Pattern	Frequency
Female keeps money and owns land	10
Male keeps money and owns land	7
Female keeps money and male owns land	12
Male keeps money and female owns land	4
Both keeps money and owns land	0
Both keeps money and female owns land	1
Both keeps money and male owns land	3
Both own land and female keeps money	5
Both own land and male keeps money	2

Note the discrepancy between male and female access to money and land is the most interesting observation to note. Though it is equally likely that either males or females will keep money and own land, the likelihood of women owning land and males keeping the money are rare. There were no cases reported where both men and women jointly kept money and owned land: either both kept the money and one or the other owned the land, or both owned the land and either one or the other kept the money. There was no gender discrepancy between who was able to use the land.

Politics is the last area of access that was investigated. With respect to politics, both males and females vote. According to the voting data from *Moo* 7, more women than men voted in the last election. However, as there is also relatively a higher number of women than men over 18 years of age and the breakdown of gender distribution of eligible voters was not available, it is difficult to determine whether the proportion of women voters is the same as that of the men.

There has never been a female head person within the village of Ku Daeng. The prevalent attitude towards women leaders as revealed by the interview schedule indicated that a female headman may not necessarily be opposed. When asked if a woman would make a good village head person, 76 individuals agreed with the statement, and 32 individuals disagreed. A total of four individuals did not respond. One man was not sure because he said that "so far there has only been men". So with lack of a concrete example, he could not judge whether a woman would be a good head person. The types of reasons women were felt to make a good head person or not, are listed within Table 4-37.

Table 4-37

Group 3 & 4 Explanation as to Whether "Women Would Make a Good Head Person"

Reasoning	Frequency
Reasons in agreement with statement	
• equal rights/equal opportunity	30
• if women have necessary characteristics	30
• women would be better	15
• better if both work together	1
Reasons in disagreement with statement:	
• man is better, he is the leader of the family, he is better respected	31
• harder for women	1

Since the gender composition of each of the groups was distinct, (women were from Groups 3 and 4, whereas men were only in Group 4) only the Group 4 data will be used to compare the distribution by gender. The gender breakdown indicated that 72.7% of women and 80.8% of men agreed with the statement. The explanations given by each gender is indicated in Table 4-38. This comparison suggests that the men are more open-minded about women head people than the women are.

Table 4-38

Gender Differences in Group 4 in Regards to Whether Women Would Make a Good Head Person

Reasoning	%F	%M
Reasons in agreement with statement:		
• equal rights or equal opportunity	11.1	**38.5**
• if women have necessary characteristics	**44.4**	**38.5**
• women would be better	**16.7**	3.8
Reasons in disagreement with statement:		
• man is better, he is the leader of the family, he is better respected	**27.8**	19.2

4.3.2.3 Conscientisation

The third area addressed was the underlying attitudes towards women and their roles. This was achieved by soliciting responses in relation to women's education, women changing their surnames when they marry, characteristics required of village head people, whether men and women were viewed the same in terms of second spouses and what was considered of appropriate occupations roles.

Formal education in Thailand started in 1855 for boys and 1901 for girls. The general intent even today is that boys are socialized to be the head of the household and the family breadwinner, thus they are socialized to be powerful and dominant. Whereas, girls are socialized to be good girls and good housewives (Soonthorndhada, 1992d). Parents are now encouraging their daughters to obtain higher education for three reasons: secure employment ensures stable cash flow to the family for immediate use, salary also helps insure a stable income in old age, and in families where land is in short supply, a daughter's education represents her inheritance (Yoddumnern-Attig, 1992a). The view that women's education was positive is echoed by the villagers in Ku Daeng. The age of marriage, especially for girls is related to the age of completing education. Those continuing full-time university education are considered still economically dependent (Yoddumnern-Attig, 1992a).

For the most part, people felt that it was beneficial for women to have a higher education than their husbands (refer to frequency column in Table 4-39), or that it didn't matter who has higher. Many felt that education would enable the women to gain better paying jobs and thus improve the contribution to the family income. All contributions would make the family better. One of the challenges that needed to be addressed by the respondents was the value placed on "better'. By agreeing with the statement, through reasons like contributing to the family through income, children or decision-making, the respondents come close to adding an unnecessary burden on women. One woman (63 years of age) said, "If she has higher education, she can become a good follower, so when the man leads, she will follow in same direction as he leads". A few felt that the man was to be the leader, that woman's role did not include leadership and therefore it was the man that needed a higher education. A minority felt that men would not accept women with a higher education level or that a woman with a higher education level would put the man down.

Table 4-39

Group 3 and 4 Explanation for Statement "It is Better if Woman has Higher Education than her Husband"

Reasoning	Freq.	F	M
• contributes to the family (income, children, decision-making)	48	*[15]	*
• does not matter	17	*	*
• up to her, depends upon the person	14	*	*
• man is the leader, woman is not the leader (thus men need higher education)	9	*	
• same level	8	*	*
• if opportunity exist	5	*	*
• education important for all	2	*	
• She could have different thought	1	*	
• will put men down	1	*	
• broken family	1	*	
• so better fulfill gender role (i.e. woman is the follower)	1	*	
• men will not accept women as higher	1	*	

---

[15] indicates that this reason was raised.

Also refer to Table 4-39 for a breakdown of the explanations by gender. Four individuals did not respond to this question. One woman (21 years of age) said, "Now I have a higher education than my husband, thus no problem". The reasons in opposition to the statement given by women that were not given by men, indicate that women tend to view the situation more negatively. The following are examples of responses by women:

- husband is the leader of the house, therefore needs a higher education level than she does (32 years of age).
- if woman had higher education, she will put down the man who has lower education, therefore man should have higher education (38 years of age).
- she could have different thought (39 years of age). (This respondent is suggesting that women with broadened scopes would be unfavourable).
- causes broken families (22 years of age).
- at first no problem, but later problem, because Thai men cannot accept when woman is higher (37 years).

Table 4-40

Group 4 Explanation for Statement "It is Better if Woman has Higher Education than her Husband"

Reasoning	%F	%M
• Contributes to the family (income, children, decision-making)	55.0	50.0
• Does not matter	20.0	23.1
• Up to her , depends upon the person		11.5
• Men is the leader, women is not the leader (thus men need higher education)	5.0	
• Same level	5.0	7.7
• If opportunity exist	5.0	7.7
• She could have different thought	5.0	
• So better fulfill gender role (i.e. women is the follower)	5.0	

Table 4.49 indicated the differences in Group 4 responses by gender. Only men over 50 felt that it was up to the woman, depending upon the person. The responses "contributes to the family", "it does not matter", "they should be at the same level" or "provided that the

the opportunity exists for a woman to further her education" were fairly equally spread between the men and women respondents within Group 4. Even within the norms of what is considered acceptable, Yoddumnern-Attig's (1992a) statement that changing times have loosened men's autonomous control over education holds true within the village of Ku Daeng, though there are still remnants of the previous attitude among a few.

Asking whether individuals agreed or disagreed with the following statement, "When a woman marries she must take her husband's surname", allowed the investigator to gain a better understanding of the values and sense of understanding of the law with respect to women's rights. Ninety-seven individuals agreed with the statement, nine disagreed and two did not know. Just under half of the individuals (42%) felt that this was necessary for reasons of the law (some specified marriage laws, land laws or inheritance laws). There is an act (Civil and Commercial Code Book 5, B.E. 2519, section 1561 cited in Somswasdi, 1991) that prescribes the use of the husband's surname. This law was challenged in Parliament in 1985, with a proposition to allow a woman to choose whether she would retain her maiden name and won a majority on the first round, but lost by a close margin on the second round. The bill was intended to give women a basic right to choice their name and thus identity. Khunying Supatra Masdit, the MP who had proposed the bill, said that it was women that had stood against her bill, arguing that it would result in a confusion over property inheritance and the name of the children (Masdit, 1991). Many villagers in Ku Daeng felt the same way. Children are to have the father's surname unless the father is unknown, in which case the child has a right to the mother's maiden name (Somswasdi, 1991). Consultation with a Thai lawyer indicated that there were no current Thai laws that exists that indicated that women had to take their husband's surname. Yet, this is what many people felt. This perhaps reflects a historical stance. Some acknowledged societal cultural traditions (9.8 %), others for the sake of the children (12.5%). The use of a surname in Thailand is a relatively recent phenomenon, so the fact that there was this desire to have women change their names must have been adopted at about the same time that surnames were adopted. Refer to Table 4-41 for examples of responses given by the women in Group 3.

Table 4-41

Group 3 Explanations Regarding Whether Woman Must Take the Man's Surname When She Marries

Coded responses	Sample of quotes from the women
Answers in agreement	
law (marriage, land or inheritance laws)	• It's the law (3:56) • marriage law (3:60)
man is the head of the family	• man is the leader of the family (3:13) • give the man respect (3:15) • respect her husband as her father, therefore must use husband's last name (3:63)
children or grand children	• easy, not a hassle, when have children and they go to school (3:26) • for her children to use it, easy for children to get in school (3:50)
tradition or socially accepted	• In respect of the traditions from before (3:48)
so last name continues on	• So last names could be carried on (3:57)
credit	• It's easy for the women, to buy things, borrow money... (3:66)
do not know	• after married, you have to use it, don't know why (3:53)
modern way	• nowadays has too (3:9) • nowadays, the "modern way" (3:20)
so know she's married	• So people would know that she's married (3:47)
other	• when marry have to use man's last name, that is the right way (3:69) • man is leader of the house, easy to find job (3:71)
Answers in disagreement	
does not matter	• It's up to them, it doesn't matter (3:64)
no need to change (equal)	• she doesn't have to, she can be proud of her last name (3:68) • nowadays women could use their own last name (3:51) • there's no need to change it (3:21) • women have the same rights, doesn't have to change name (3:10)
other	• I don't use my husbands last name, I don't know about anyone else (3:79)

Using the Group 4 data to compare responses by gender reveals that there is a fairly equal distribution between the two (see Table 4-42). However, there were a few reasons that only one group mentioned. For example, men listed reasons of convenience, employment as reasons for agreeing with the statement, and "no need for change (4:10)" and "women has a right to decide whether she wants to change it (4:6)" as reasons for disagreeing. No women in Group 4 disagreed with the statement. One woman attributed family stability as a reason for agreeing with the statement.

Table 4-42

Group 4 Explanations With Respect to a Woman Taking the Man's Surname When She Marries

Reasoning	% Female	% Male
Reasons in agreement with statement		
• law (marriage, inheritance, or land laws)	65.0	57.7
• man is the head of the family	10.0	11.5
• children/grandchildren	5.0	7.7
• tradition/socially accepted	5.0	3.8
• so last name continues on	5.0	3.8
• family stability	5.0	
• convenience		3.8
• employment		3.8
Reasons in disagreement with statement		
• does not matter		3.8
• no need to change (equal)		3.8

The question relating to female headmen also allowed for a glimpse into what was deemed to be the requirements of a headman and whether women possessed these characteristics (refer to Table 4-43). Characteristics of a good head person included the following: knowledge of the law, being brave or courageous, having a higher education, being good, having ability, possessing physical strength, being polite, responsible, and "other". Examples of the "other" responses are listed below:

- better than men, women are more careful (37 year old female)
- women are more honest than men (35 year old female)
- I think that she could do it, women are more generous (nicer) than men (76 year old female)

- women don't have the aptitude in leadership (65 year old male)

For the most part, those who felt that women would make a good head person believed that women had the ability, but those who disagreed, felt that women lacked the physical strength. When the investigator asked the headmen the same question, the headmen replied that "women have the same ability as men". Neither of the headmen commented on physical strength. This indicates that perhaps there some villagers have a misconception about the extent of physical strength required of a headman.

Table 4-43

Characteristics of a Good Village Head Person

Characteristics	Women would make a good headman		
	Agree	Disagree	Total
Female Respondents			
knowledge of law	3	1	3
brave/courage	7	2	9
higher education	8	1	9
good	3		3
ability	**15**	1	16
physical strength		**13**	13
polite	1		1
responsible	3		3
other	3	1	4
Male Respondents			
brave/courage	2		2
higher education	3	1	4
good	2		2
ability	**7**	2	9
physical strength		1	1
other		1	1

note: at least 10 of the respondents had listed two characteristics

Another cultural norm that is still somewhat prevalent is that of having a second wife because within the family law there is a loophole that enables husbands to multiple marriages. The law (Civil and Commercial Code 1935, section 1488) stipulates that a marriage can take place only if the man or women is not already the spouse of another person, but since the first spouse is unaware of other marriages till death and property is divided, there are no grounds to prevent this from occurring. In other words, the only way a man would be "caught," so to speak is after he has died. There was no system to ensure the marital status of marrying couples (Somswasdi, 1991:8). About half of the individuals responded in agreement that "A wife with another man is worse than a husband with a second wife." The other half disagreed. The reasoning given for the response is shown in Figure 4-7.

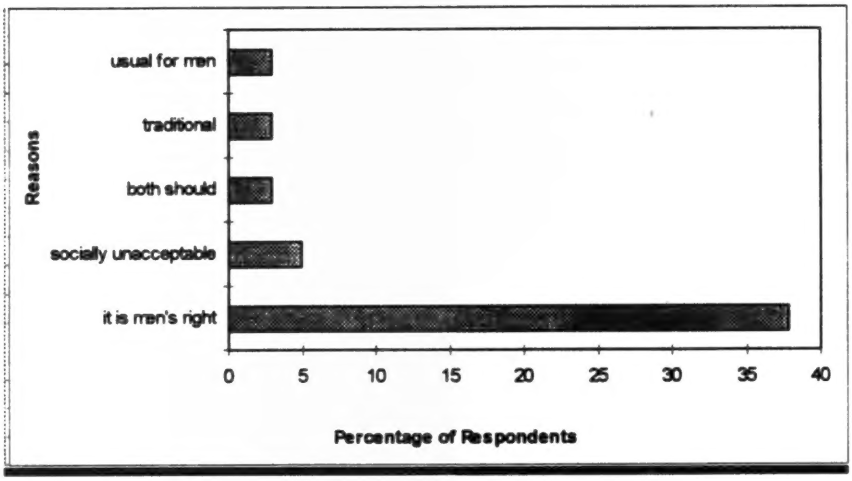

Figure 4-7: Explanation for the statement, "A wife with another man is worse than a husband with a second wife."

Almost half felt that it is the man's right or that it was usual for the man. The figure also shows the percentage of respondents that gave each type of response. See Table 4-44 for a further examination of the Group 4 data split by gender.

Table 4-44

Group 4 Response to "A Wife With Another Man is Worse than a Husband with a Second Wife"

Reason	Females	Males
• Both agree and disagree since both cases are bad	12	13
• Agree as men have the right, women do not	3	10
• Agree as usual for the man	3	2
• Disagree due to cultural or traditional law	1	
• Disagree as both should have an equal right	1	

The final area that was investigated in terms of conscientisation was occupational roles. The respondents in Group 4 were asked to list five occupations which women should do and then five occupations that men should do. The responses to the two questions were then compared. There were a total of 50 responses out of 325 that overlapped. This means that 15.4% of the responses given on occupations were considered to be appropriate for both men and women. Of a total of 16 possible occupations, the women respondents indicated that seven of them should be done by both men and women, and of the men, eight were listed as those which should be done by both. The overlapped responses from the women were: government worker, orchard farmer, merchant, labourer, factory labourer, agricultural worker, and construction worker. The overlapped responses from the men were: farmer, orchard farmer, vegetable farmer, merchant, labourer, factory labourer, agricultural worker, and construction worker. Overall, both women and men respondents seemed to indicate through their responses that men and women should do different work. This suggests that "equal opportunity" is not necessarily the norm sought in terms of occupational choices for both men and women.

4.3.2.4 Participation and Control

The fourth area of investigation was participation and control. These were combined to be "power". Power issues were dealt with from a decision-making and control perspective. Decision making was assessed in terms of who decided how land should be utilized as well as who decided how many children to have.

In general, more men than women made decisions regarding the land and approximately one sixth of the respondents stated that joint decisions were made. Comparison of who owns the land and who decides the use of the land shows that, for the most part, the person who owns the land is also the one who makes the decisions about the land. The following are a few variations from this:

- the respondent made decisions about the land, yet it was owned by both husband and wife (69 year old male)
- the respondent made decisions about the land, yet it was owned by the parents
- the spouse made decisions about the land, yet it was owned by both husband and wife

- the spouse made decisions about the land, yet it was owned by the parents
- the respondents' child made decisions about the land, yet it was owned by the respondent (63 and 77 year old females)
- the respondent's child made decisions about the land, yet it was owned by the grandparents (50 year old female)
- the land was jointly owned by the husband and wife, yet the respondent made decisions regarding use (a 58, 59 and 69 year old male)
- the land was jointly owned by the husband and wife, yet the spouse of the respondent made decisions regarding use (55 year old female)

Control was dealt with by looking at choice in terms of marriage practices and control of body, with respect to deciding when to become pregnant. Yoddumnern-Attig (1992b) found that in Thailand, decisions tend to be taken mutually, though the women has the greater role when it comes to issues pertaining to family size, birth spacing, and child care.

Eighty-two percent of respondents agreed that both men and women should determine who to marry; they felt that the individual could choose best. Twelve percent felt that one or the other should decide, though there were a few more people who disagreed that a woman should decide than who disagreed that a man should decide. Just under four percent felt that neither should choose, either because they should both choose, or because the parents should choose.

Control with respect to the decision to become pregnant fell mostly to the wife, since it is "her body and she knows when she is ready". Those that disagreed felt that both should decide, and that other factors, such as income level, must play a role in the decision making.

4.3.3 Meeting Women's Needs for Environmental Awareness, Attitude and Action.

The first objective of this research study was to examine environmental education for women within the village of Ku Daeng. In order to gain an understanding of what the environmental education needs are, it is important to look at the past, the present, and then to the future.

4.3.3.1 Background

It was important to gain an understanding of what was the environmental education situation was. To show the previous and current exposure to environmental education, both the past and the resent are combined in this analysis. It allows for an assessment of the background of the participants, by investigating previous formal and informal exposure.

The women were asked whether they had learned about environmental issues within school. Most of them (71%) said they had not, about a quarter (24.6%) said that they had, and a few (1.5 %) said that they did not know. For this question, one person did not answer and for two women, the question was not applicable, since they had not attended school.

Learning about environmental issues, if at all, seemed to occur only for respondents who had at least four years of education. Those that reached level four recalled learning about waste disposal issues: littering, separating garbage, etc. Those that had attended secondary school remembered learning about air pollution, as well. In terms of age: those that remembered learning something in school about environmental issues were between the ages of 20 and 69. Refer to Figure 4-8 for more details of the types and frequency of topics included in environmental education. The issues indicate the extent of exposure, for the 19 women and 14 youth who remembered learning about environmental issues within the formal educational system.

The role of media and the role of discussion groups were two of the areas that were explored to gain an understanding of current sources of environmental information. The most commonly referred to sources of environmental information as revealed by the women were television and radio (refer to Figure 4-9). Magazines and newspaper were referred to by the fewest number of respondents. This suggests the relative importance of each of these sources, as perceived by the women. The most common newspaper stated was *Thai Rat*. When asked who they discussed these types of issues with, the majority of responses (20 women) was with friends. Family was mentioned by six women, one of whom specifically mentioned children. Two women did not respond, the remaining six listed at work, school, cemetery, parties, or with the headman/kamnan.

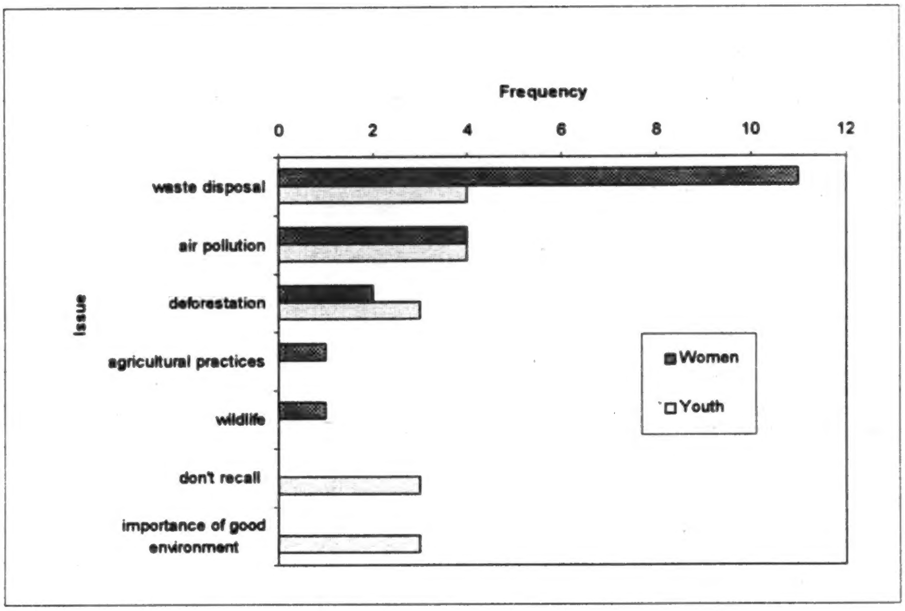

Figure 4-8: Issues learned in school.

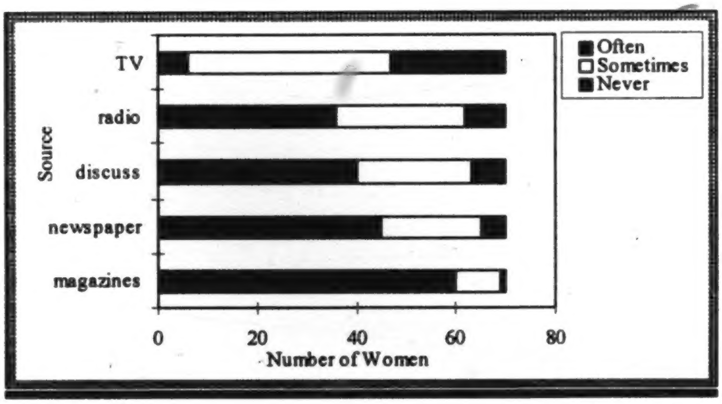

Figure 4-9: Women's sources of environmental information[16].

The women were also asked whether they belonged to a group where environmental issues were discussed. One woman did not respond and 60% of the women said they did not belong to such a group. Approximately, 39% of the women said they did belong to such a group, of these women, the type of group in which they stated that they belonged is listed in Figure 4-10 the most common response being a group of friends. Initially this question was asked to determine if there was participation in formal environmental organizations, the responses revealed that this was not the case. However, environmental issues were discussed in a variety of types of groups.

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[16] Note: those who did not give a frequency but stated yes, were put into the "sometimes" category.

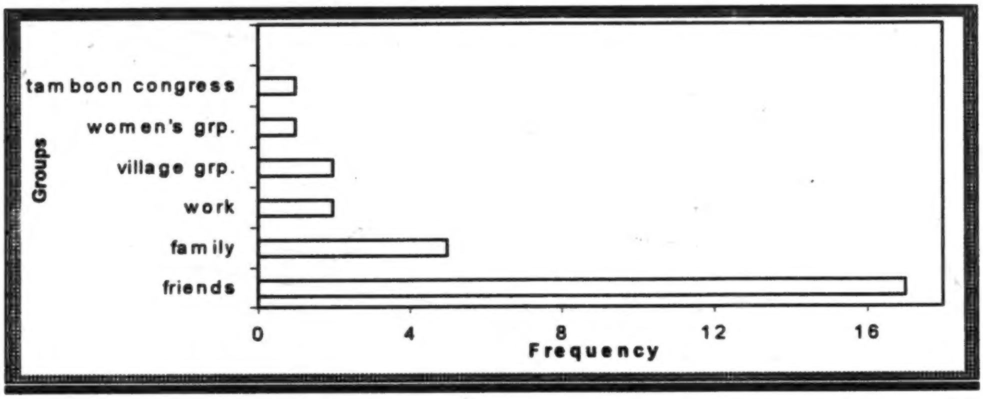

Figure 4-10: Discussion groups utilized by the women.

4.3.3.2 Future

The future, including the issue of the goals of an environmental education program depends greatly on what people feel the current needs are. In assessing the needs, the investigator looked at what education the participants felt was required, who they felt should be responsible, how environmental information should be disseminated, and barriers to environmental education.

4.3.3.2.1 What Education is Required:

The most frequent answer to the education level that was required, was all levels/any level (refer to Table 4-45). In general it was believed that it didn't matter what level of education one had, as long as everyone took part. Only one person said that none would be sufficient, but the feeling was that all could play a role in solving environmental issues. The youth predominately responded in the same way. Education was seen as important.

Table 4-45

Level of Education Required to Solve Environmental Issues

	Youth	Women	Total
none		1	1
primary level		1	1
secondary level		2	2
post-secondary level	1	7	8
expertise/knowledgeable		5	5
anything/all levels	**9**	**41**	**50**
do not know		4	4
not applicable or blank	1	9	10

4.3.3.2.2 Who Should Teach

The overwhelming response to who should teach, was for the headman (See Table 4-46). The headmen however did not indicate that this was a role that they should fulfill. They did feel that they could and would assist in environmental education, but did not advocate being entirely responsible for it. Government development officers, teachers, and parents are the next choices. It was interesting to find children being listed. Some people do see children as a source of environmental education.

Table 4-46

Who Should Teach About Environmental Issues

	Youth	Women	Total
parents	3	3	6
children	1	4	5
headman	**4**	**39**	**43**
monk	1		1
government development officer	2	14	14
teachers	2	10	12
environmental education specialist	1	1	2
none/self teach		4	4
group of housewives		1	1
do not know		3	3
not applicable or blank			7
>1 response	3	15	18

4.3.3.2.3 How Should they Teach

Among those who indicated the level in which they could view environmental education being effective, the village level carried the most weight. The methods that were generated as being the most effective are listed in Table 4-47. The most popular method of environmental education that was mentioned was by a meeting. Historically, this was one of the only means of communication within the village. Though there were no meetings held during the time the investigator was present within the village; temple gatherings at times served some of the functions of a meeting.

Table 4-47

The Best Method of Environmental Education?

	Youth	Women	Total
announce on loud speaker	3	8	11
meeting	**3**	**31**	**34**
via example		1	1
one on one	1	3	4
demonstration	2		2
media	2	3	5
by doing/hands on	1	1	2
not specified	1	14	15
do not know		2	2
n/a	0	9	9

Each of the methods mentioned by the respondents were didactic, top down, expert-centered approaches, except for the "doing".

4.3.3.2.4 Why is a Particular Method Best?

Women and youth were asked why the method was most effective. The responses were categorized and are summarized in Table 4-48. A number of things are exposed from these responses. Effectiveness was based on which method would enable them to learn better, which would be easier to coordinate with respect to time and access, and which would allow them to solve the issue together.

Table 4-48: Reasons Why Method Selected was Considered Effective

	Youth	Women	Total	Examples
learn better	6	20	26	• …so people notice why it is bad (2:1) • is the easiest way to learn things (3:8)
can solve together	1	12	13	• so everyone will know each other and can work together to solve the issue (3:6)
time	2	10	12	• …it saves time (3:4)
access	1	7	10	• …is easy to coordinate (3:4) • gather for meeting, so people can learn the same thing all at once (3:63)
leader/follower	1	2	3	• …if the headman starts, others will follow (3:23)
no best method		2	2	• when come to give education, doesn't work, people don't bring education to help the village, they don't care...(3:59) • no best way, up to the person who comes to teach (3:80)
ease		3	1	• … is the easiest way to learn (3:33)
do not know		3	3	
not stated/blank	2	11	13	
n/a			9	

4.3.3.2.5 Barriers

In designing an environmental education program, it is also important to understand what the participants feel are barriers. Barriers are what prevents us from achieving what we desire. Some of these barriers can also be considered accessibility issues. Barriers include:

- practical
- temporal
- social
- physical
- economic
- mental (mindset)

One portion of the interview schedule involved describing what was seen in various photos taken in the surrounding community. When environmental issues were raised, the women and youth were asked to explain why the situation currently existed. Indirectly this question allowed the investigator to gain an understanding of the perceived barriers to sustainable action. Following are examples of the types of responses and how they were that were categorized.

- "no other better way [alternative is worse, have to]
- "People don't help out, they all do their own work, no time" [time]
- "…no time because of economy" [time]
- "carelessness", lack of people responsible for that place" [responsibility/ownership]
- "because they are not concerned with it as a belonging" [responsibility/ownership]
- "no place to throw it" [lack of resources]
- "not enough people, therefore can't hoe it all" [lack of resources]
- "they don't know the method to protect" [education/knowledge base]
- "people don't know the consequences", "lack of education"[education/knowledge base]
- people have different thoughts, some say that it is easy [convenience]
- "easy, fast, saves labour", "habit/easy to do" [convenience]
- "weeds grow fast", "natural for grass to grow" [control-natural]

Figure 4-11 lists the types of responses that were raised by the women and the youth. It reflects the proportion of the six photos in which the barrier was raised, by each of the groups.

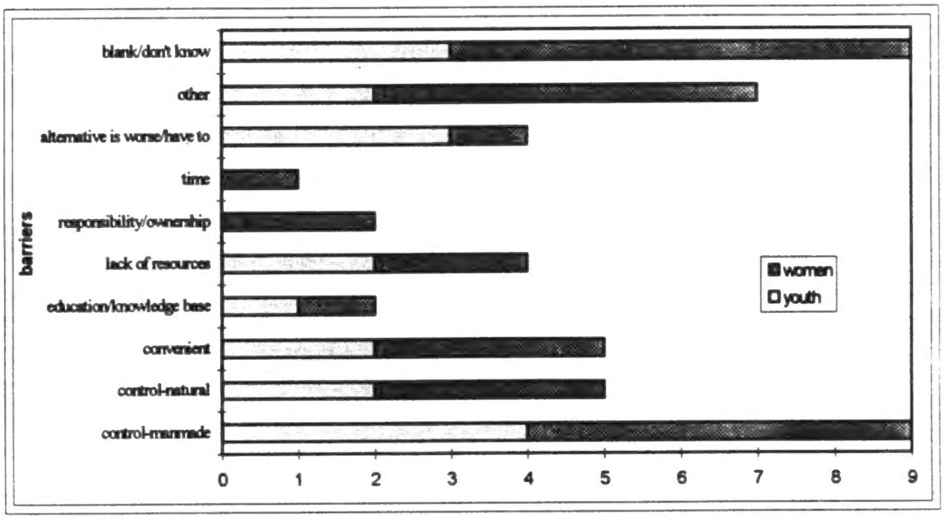

Figure 4-11: Women and youth's perceived barriers to environmentally sustainable action.

This chapter has provided a description of the study area, the participants and their views on gender, environmental issues, and environmental education. The following chapter will focus on the implications of the above findings in relation to environmental education programming for women within the village of Ku Daeng.

5. Discussion

This section reflects upon what the findings of this research imply with respect to environmental education. The first part reiterates a brief summary of the findings, while, the second part deals with the background required to plan an effective environmental education program by briefly overviewing "what is known by the participants". The third section covers where environmental education could be directed towards and the fourth section covers the methods to employ within environmental education; including both the "who" and the "how". Thus, this discussion is a recommendation of the content and process of environmental education for a specific target audience: women in the village of Ku Daeng. The final section considers implications for the future including areas that need to be researched further.

5.1 Brief Summary of Findings

5.1.1 Content of Environmental Education

Definition of the term environment was problematic in the village context. One reason suggested to explain this was that the Thai term for environment, *singvetlom,* was used more in the academic circles. There were more issues raised by respondents for natural environmental issues than for social environmental issues. Overall there was an acknowledgement that there were local issues that needed to be addressed. Economics, aesthetics, and health were most commonly listed reasons for issues being important. Environmental values were not raised as often, suggesting that an intrinsic appreciation of both the natural and social components of the environment needs to be fostered. There was little value placed on the personal influence one has on the environment. Both proactive and reactive measures were listed as solutions to dealing with various local issues. Findings related to mineral fertilizer use suggest a differentiation in risk perceived to be associated with use in their orchards (where final product is primarily sold outside the village) and within their own house compounds (where produce is consumed within the village).

5.1.2 Environmental Education Process

The formal school system was not the primary source of information for adult women. Television and radio were more frequently accessed, however all levels of education were seen as vital. The headman was considered to be the most appropriate deliverer of environmental information, though government development officers, teachers, parents, and children were also listed by a few. The women felt that in order to meet their needs, environmental education would need to be set up in a way that enabled them to effectively learn and allow for cooperative action to solve environmental issues. They also felt that the process needed to be easy to coordinate.

Of the five main areas of welfare, access, conscientisation, participation and control identified as related to gender in this study, the last four were the most pertinent within the context of Ku Daeng. Though welfare was not a large concern for many of the women, one of the flip sides to having welfare needs met, is the growing consumerism that was evident within the village. This instead will need to be addressed by the villagers. Most of the women had access to time, education, money, and land. Thus these factors would not become constraints for these women's participation in environmental education. For those women for whom time was an issue, gendered roles accounted for the lack of time. It was interesting to note that for the women within this particular village, lack of leisure time was not connected to management of natural resources, as often suggested within the literature. In a way this shows the unique position of this setting from other places that have been studied. What these constraints do suggest is that for these few women, time would need to be considered when designing environmental education programs. The fact that women have not been involved in local politics within Ku Daeng suggests that there are barriers to women's access to local administration, though access in terms of attitudes were for the most part ruled out as a barrier.

In terms of conscientisation; women are seen to have many of the same abilities as men, but are not necessarily given the same freedoms nor rights. Men and women are seen by many to have the ability to be educated or to run for politics, but face different socially acceptable norms. The difference in socially accepted norms may constrain the women's participation in environmental education by introducing differences in the perceived responses that women may have. In terms of participation and control, men are more likely to make decisions involving the land and women more likely to make decisions about when to have children. Lack of control in terms of land, may constrain a woman's ability to act. For example, when women are unable to participate in the choices of what to plant or how to maintain the soil fertility, this can have an impact on whether they feel that environmental education would be of any use to them. If they do not feel that they can make meaningful alternative choices in order to make a lighter impact on the earth, because they are restricted from the decision making process, the goals of critical thinking and environmental *awareness*, *attitude* and *action* may not be achieved.

5.2 Background: Start where you are

To be effective environmental education needs to begin with what is known both by prospective participants and about their immediate environment. This involves understanding people's conceptualization of environmental issues. This section considers the implications of the findings of this study in the terms of environmental *awareness*, *attitude* and *action* (AAA).

Cantrill (1992) points out that people do not consume environmental information in a cultural vacuum. "[R]eality is a mentally constructed phenomenon that may bear little resemblance to the factual world" (p. 37). Therefore, it is imperative to gain an understanding of how people perceive nature and environmental issues. In addition, in order to be the most effective, environmental education's focus must be on those issues directly affecting the audience. For example, rural audiences may find issues like the health effects of pesticides or prevention of erosion to be most relevant, thus environmental education should be tailored to meet the needs of audiences (Lewis & James, 1995).

5.2.1 Awareness, Attitude, Action

A holistic approach to teaching and learning that recognizes the inter-relatedness of AAA has been shown to be most effective (Ballantyne & Packer, 1996). The reduction of environmental education into these three aspects is merely a conceptual tool and thus should not serve as a determining framework to an educational approach but merely as a guide to analysis and planning. Merely reducing environmental situations to AAA contradicts the holistic approach. Standing alone, no one aspect, will alleviate environmental pressures, but in combination they make a worthy force. In this thesis, the breakdown of the proposed educational approach into these three dimensions is made merely for ease of reading and conceptualization. It is not meant to suggest that any one should be the focus.

5.2.1.1 Awareness

Although awareness may be indicated through the knowledge about selected individual issues, there is still a need to look at the total situation. Examining topics as defined by the participant may provide an indication of where to begin, but is insufficient to develop a program to understand the whole picture. Environmental education needs to provide people with the tools to increase their awareness of a range of potential environmental issues and not just deal with only those they are already aware of. The fact that many in this study did not link dependency or over-use of mineral chemicals, such as herbicides, to a contaminated water supply is one example of the need to move beyond current awareness.

Focusing only on awareness is a "well-informed futility", where one's civic obligation becomes to be merely informed about environmental issue (Wiebe, 1973). In other words, only becoming informed becomes the goal. This leads to people taking a more passive role, rather than an active one aimed at changing the status quo. This is one of the challenges that must be taken into account when designing programs for the village.

The types of issues that were raised by the women of Ku Daeng indicates their level of environmental awareness and these should be the issues with which to begin environmental education. Water and waste disposal were the most commonly raised issues. Considering the broad health implications of both of these issues, it is not surprising that they were the most frequently raised.

Waste disposal was perceived by study participants from a variety of perspectives. Scarcity of resources in terms of land or space was one aspect. Another aspect was the high demand due to the quantity of waste produced on both an individual and a collective level. Aesthetics or lack thereof, was another factor depending upon the disposal mechanism followed. This is in keeping with Boerschig & De Young (1993) who makes a case that a good starting point for environmental education is to deal with waste management issues. It is assumed the adults of Ku Daeng would relate to this approach and would have points of view and/or experience to contribute to a discussion on this topic.

5.2.1.2 Attitude

There have been many suggestions of what factors contribute to the formation of environmental attitudes:

- initial predisposition and further activist (Newhouse, 1990)
- childhood experiences of the outdoors and parental/adult's influence (Palmer, 1993; Tanner, 1980).
- scientific evidence especially when linkages can be made between environmental abuses and health problems. Yet, there is also the recognition that "science can only take us so far, particularly since the scientific method is unable to address the moral issues" (Bowers, 1995:25).

The values indicated by the women of Ku Daeng could enable environmental educators to couch educational programs with these terms in order to initially enable participants to relate to issues, especially as new ones are introduced. For environmental issues, the most important values indicated by the women of Ku Daeng were economic, lack of power/control, aesthetics, human health, and mobility. In terms of water, matters of human health were the most valued. The least important were financial and environmental reasoning. As indicated previously, this suggests that human factors need to be emphasized initially, in order to capture the attention of the population. However, this would be insufficient and environmental values must still be reflected upon, as a lack of this approach would ensure an unsustainable future.

There is a linkage between attitude and action. This can be seen through the tradeoff in action based on whether something is perceived as abundant or scarce. Decreasing consumption was primarily listed as a means of dealing with waste only by those who felt that waste disposal issues were problematic within the village. This also ties into relative affluence or poverty, and shows that those who perceive themselves to be poor are more likely to be open to decreased consumption as an option, whereas those that are affluent, seem to view consumption as a right they are entitled to. An example of this was observed by the investigator during the interviews. When the question was posed as to whether plastic was reused, many of the respondents provided both verbal and nonverbal cues that indicated that they did not want to be perceived as having reused plastics. The interpreter confirmed that the women did not want to come across as being poor. Reusing plastic was viewed as something to do only if one was less affluent.

Another area within attitude is assuming responsibility. A sense of responsibility to solve environmental issues and to teach environmental education was attributed first to the headman of Ku Daeng. Thus, the headman is probably a critical factor to the success of any environmental education endeavour in the village. It is strongly recommended that initially the headmen in the village along with the female leaders (for example, the women who lead the women's group) are exposed to environmental education, as their environmental AAAs are perceived by many to be a sufficient form of environmental education.

5.2.1.3 Action

The lack of awareness by the respondents of the personal human influence on water quality is an example of a key environmental education target. Unless people examine more carefully at their own actions and understand the consequences of them, it will be difficult to look at collective action for the village to improve water quality.

5.2.1.3.1 Why Issues Exist-Barriers to Action

There are many barriers to *action* outlined within the literature. Simmons & Widmar (1990) discuss perceived knowledge of action strategies, inconvenience, time consumption, and loci of control. According to Vitouch, (1993), non-proecological behaviour occurs for mainly three reasons: it is pleasant, one has gotten accustomed to it, and the conditions for it exists. Simmons & Widmar, (1990) also suggest that the ability to overcome barriers is crucial and Nyamwange, (1996) feels that continuous education is key to successful action.

Being aware of the barriers that are perceived to exist by the participants is important, in determining an effective method of environmental education. One way of assessing this information is to ask the participants why the issue continues to exist. The responses in this study reveal some of the barriers to "doing". Some of these barriers may be overcome through education, yet others need to be dealt with through other means such as through policies or economic incentives. Barriers that were indicated by the women and youth in this study included: a lack of a sense of responsibility or ownership, insufficient knowledge base or lack of education, inconvenience, time constraints, lack of resources, lack of control (due to either manmade or naturally occurring circumstances), the belief that the alternatives are worse, thus feel the belief that one has to continue with the status quo. These reasons may be classified into two main areas: barriers in terms of the content and barriers in terms of the process. Barriers of content, include those barriers to action. Those of process are the barriers to environmental education. Those of content will be dealt with here, those of process will be dealt with in section 5.4.

Barriers to action, can be subdivided into two categories: those that deal with awareness and those that deal with attitude. Lack of awareness prevents one from acting responsibly for a number of reasons. One may be unaware of the issues; have an insufficient knowledge of the depth and breadth a specific issue may cover; one may be unaware of the various barriers that may prevent one from taking a specific action; in addition, one may be ill prepared in terms of skills development.

Inappropriate or counterproductive attitudes may result from unsustainable values. An overemphasis on either individual or collective values may act as a barrier to action. For example, social norms may reflect underdeveloped collective values that perpetuate the status quo rather than change. The same may be true of individual values. The prevalent world view is another example where values and attitudes can create conditions for inaction or inappropriate action. An example of this is the belief that by conserving resources (i.e. by recycling or reusing plastics) one gives the impression of poverty rather than affluence.

Since it has been shown to be ineffective to focus entirely on one or two of AAA, it is recommended that any programs developed sufficiently address each of these areas. This study has shown that there is some degree of AAA present among the respondents. However, this research also shows that there is a need to provide environmental education to build on and further develop each of these areas in order to instigate environmental change in Ku Daeng.

5.2.1.3.1.1 SOCIAL NORMS REFLECT COLLECTIVE VALUES

Recycling is an example where, we as humans can follow nature's lead. Cherif (1995) refers to nature as the efficient recycler. Recycling is couched in terms of survival. However, considering the negative feedback associated with recycling plastics within the village, perhaps due to feelings of "poverty" that are associated with this survival mechanism, "we don't recycle because we don't need to", brings the need to address this issue from a different perspective. The potential negative connotations of recycling, reusing, and reducing must be taken into consideration.

Social norms may prevent people from acting in the way they would like to. "The effects of norms on behaviour have strong implications for conservation. If a social norm for responsible environmental behaviour existed, more people might behave responsibly, even if they did not have strong attitudes about environmental protection" (Newhouse, 1990: 27).

5.2.1.3.1.2 MOTIVATION

Public education programs must build upon several motivating factors, especially considering that different motivations will appeal to different people (Simmons & Widmar, 1990). It is important to expose learners to different motives so that they are better prepared to evaluate critically their own individual and collective reasoning. Some motivations for actions that were noted in the literature include: basic values; desired lifestyle; sense of environmental or social responsibility; general concern for the environment, and economic motivations.

However, there is still uncertainty as to whether behavioural changes induced through economic incentives have persistence even after those incentives are removed (Witmer & Geller 1976, as cited in Simmons & Widmar, 1990).

5.3 What environmental education might be:

It is important to clarify what effective environmental education might be. Three areas that appear to be considered important in the literature are selecting an appropriate paradigm, goals such as the creation of sustainable societies, and focus in terms of individual or collective.

5.3.1 Paradigms:

Even when examining specific issues, different people will see the same issues in different ways (de Haven-Smith, 1988, as cited in Cantrill, 1992).

> *...Learners may come to a learning task with different conceptions, [consequently] they will learn different things from the same event (Driver, 1984), and apply their understanding in different ways. To design meaningful learning experiences, educators must be aware of the range of conceptions held by [learners] and how these might be supported or interfere with the new information being presented or the desired learning outcomes* *(Ballantyne & Packer, 1996: 27).*

This is reflected in the current study, by the varying responses given by respondents for the cause and effects attributed to local environmental issues. For example, dealing with waste disposal by burning garbage within each household, was viewed by some as a necessary evil, because the alternatives were worse and resources were scarce. Yet, others felt that that the reasons for the issue existing was consumption or population pressures. See Appendix C-2 for more examples of the variety of ways in which the same issue is perceived.

There have been few studies of the broad conceptual frameworks that influence learners AAA. Wals, (1992) discusses three distinct ways of thinking about environmental issues: personalistics view, technocratic view and the politicized view. In 1995, Ballantyne described three parallel conceptions: egocentric, guardianship, and ecocentric (as cited in Ballantyne & Packer, 1996). Though this type of analysis was not a focus of this study, at a later date, it would be a useful exercise to see which of these conceptual frameworks the participants view's support. Further, it would be useful to determine if the paradigm varies from youth to adults.

5.3.2 Sustainable Societies

The ultimate goal of environmental education is to create sustainable societies.

> *Teaching sustainable development requires thinking about sustainable societies...So long as sustainable development remains only an ideal, it will have relatively little influence on people's beliefs and actions...Teaching about sustainable development [requires] ...turning the idea of sustainable development into the reality of sustainable societies.*
>
> *(Slocombe & Van Bers, 1991:18)*

However, this is certainly not a task only for environmental education, as it requires redesigning society in such a fashion that the long-term impacts of human activities on both the environment and on society are minimized (Slocombe & Van Bers, 1991).

Jickling (1992) however, disagrees with this view. She feels that "education is concerned with enabling people to think for themselves...education for anything else is inconsistent with that criterion" (p. 8). She notes that the very idea of educating for sustainable development is contrary to the spirit of education. In her view, one should not educate for sustainable development, but one can educate about the concept, so to "enable students to debate, evaluate, and judge for themselves the relative merits of contesting positions" (Jickling, 1992:8). It is important to note however, that Jickling's comments are based on the idea that education can be objective, whereas it cannot. In addition, she assumes that environmental education is the same as education, however, Fien (1995) provides a reasonable explanation of how environmental education is different from other types of education, though they share similar tenets.

5.3.3 Individual versus Collective

There are two general targets for which environmental education can focus: the individual and the collective. Environmental educators' opinions vary in regards to which target is the best. Part of the reason for this lies in how environmental issues are viewed.

Environmental educators, such as Gigliotti (1990), discuss the need to have a more individualistic approach to environmental education. The feeling is that environmental education messages have not emphasized the connection between limited resources and what that means to the individual (Gigliotti, 1992). However, others feel that the focus on the individual is counter-productive. Three such arguments follow. The first deals with the assumptions pertaining to individualism. The ideology of individualism, assumes that the proper study of society concentrates on individuals - that individuals are the basic unit of analysis (Tesh, 1988). Vitouch (1993) suggests that the threat of diffusion of responsibility as experienced within first aid situations and documented by Darley and Latane in 1968, creates "a society of ecological bystanders"(p. 345).

The second problem is that in an individualistic ideology one ends up "blaming the victim…[failing to address the]…social, historical, and political factors that mitigate against changes in behavior" (Robottom & Hart, 1995:7). Part of where the focus should lie, depends on the nature in which environmental issues are perceived. Often we tend to "create a sense of individual agency and responsibility that is unrealistic in light of a range of sociopolitical constraints in the community; and that…misrepresents the nature of environmental issues by emphasizing individual human agency as the key factor in issue resolution" (Robottom & Hart, 1995:8).

All these arguments, which in many ways reflect North American views, suggest that we must be wary of highlighting individual responsibilities without considering broader social pressures (Robottom & Hart, 1995). Thus is born the concept of a collective target. Vitouch, (1993) says that we should speak in terms of a "collective (ecological) responsibility" (p. 345). This may be particularly important in other cultures.

"Environmental problems are not objectively existing physical phenomena…They are social constructions whose meaning and significance metamorphose and wax and wane according to changeable human interest" (Robottom & Hart, 1995:8). Robottom and Hart (1995) go on to state that on a basic level, environmental issues are political in nature, and that collective action is usually more productive than individual efforts in the resolution of political struggles. A recent example within Ku Daeng, where this is clearly evident is in the struggles the villagers had with a local buffalo skin factory. The factory effluent was being discharged upstream from the village. One woman said that the water turned from clear to black overnight. In addition there was a unpleasant smell emanating from the water. The contaminated water had affected the canal system throughout the village. The headmen attempted to resolve the issue with the factory, but in the end it required the collective group of villagers to march in protest. The government then came in and relocated the factory. But as one woman pointed out, the factory may have left, but we must still deal with the repercussions of their actions. It will take many years before the waters will be clean again. Another side that was not raised by the villagers is that the pollution problem merely relocated with the factory, the problem itself was not dealt with, merely exported.

Bowers (1995) puts the emphasis on culture and language. He regards it important to critically question how our language and culture influence our individual and collective impact on the environment. In doing so, he suggests making a "a radical shift away from the current emphasis on individually-centered creativity, and toward a greater emphasis on using the arts as a form of cultural storage that enhances communication between generations and across species, about how to live in ecologically sustainable relationships....it would represent a form of rebalancing of the individual's relationship with the larger culture, as well as with the life sustaining characteristics of natural systems that make individual/cultural life possible" (Bowers, 1995:11).

Though both views make valid points, neither alone will alleviate the problems. The problems are complex and thus need a complex set of strategies and environmental education frameworks and targets to be remedied. There must be a recognition of both the need to increase the responsibility of the individual and of the whole society (Vitouch, 1993). Certainly the example of the skin factory incident, shows how water pollution from the factory required the collective action of the villagers to instigate change. The local waste disposal challenge however required the concerted efforts of both individuals and the collective group. The social norms that make recycling plastic something to be shunned, the consumption patterns that help to exacerbate the situation, the way in which society promotes consumption, the household solution to burn in an attempt to "make the problem disappear", are all factors that need to be addressed, and neither an individual nor collective effort alone will solve this problem.

Considering the interplay between the individualistic undertones of Thai culture and the needs of society, the case for both remains the strongest. Methods of environmental education that were considered effective by the women, included a component to allow for the issues to be solved together. This desire indicates the needs to have a collective target group. However, even though eastern community concept holds true there is a sense of individuality that pervades through the culture. Kullick (1996) describes Thailand as "Being a world of individuals...Thais are themselves very individualistic, enjoying a strong sense of individual autonomy and liable to stray into eccentricity" (p. 62). Kulick & Wilson (1996) feel that the root of this individualism is Buddhism. Buddhism teaches the Thai to concentrate on self-cultivation more than social work, thus there is no universal ethic, universal morality, nor tightly knit structures or social groups. These two examples may paint a contrasting image, however, it shows the dynamic nature of Thai culture. Thus, due to the fine balance between the two, both a collective and an individual target should be the focus of any environmental education approach to be used at a village level in Ku Daeng.

5.4 Barriers to environmental education

Two main barriers to environmental education especially for the women of Ku Daeng were identified by the findings of this study: access and social norms.

Access issues include time and opportunity. For many women access to time was not restrictive, but for other women, the demands of their gender roles create difficulties in terms of time constraints. This itself can decrease the opportunity for these women to access environmental education.

A second issue is social norms as a barrier to environmental education. Modernization creates a big gap between those who have the opportunities for a better education and a better standard of living or both, than those who do not have these opportunities. Thus,

> *"not everyone becomes successful in the modern society where materialism is valued....Equal opportunity in social progress should be promoted in terms of social and cultural orientation. Youth should be given an chance to develop their emotional and intellectual capability, social commitments and moral development. This will help maintain society and place less value on materialism" (Soonthorndhada, 1992d:62-63).*

5.5 Extension Program/alternatives.

Lewis & James (1995) raise the need to use a method of education presentation that is compatible with the learning styles of the intended audience. This is important for all forms of education. In determining what methods to employ for environmental education it is important to discuss who should be involved and how and when environmental education might take place.

5.5.1 Who

To be effective, environmental education must be inclusive in terms of the audiences it reaches as well as the issues raised (Lewis & James, 1995). This study recommends the inclusion of women and an educational approach that reflects their unique needs. However, it is also imperative that men are not excluded. Focusing this study on women was intended to ensure that women are not forgotten, but not to suggest ignoring men. Such a stance would assume that women are the only resource managers, and that too would be an unfair and inaccurate assessment and would place an unfair burden upon them.

From the respondents of the study, though the headman was considered to be the most responsible, there was a general agreement that all could play a role in solving environmental issues and that all levels of education were important. The headman represents a link with government, as government initiatives filter through them. However, the headman also acts as a representative on behalf of the village to higher levels of government. Consequently, if environmental education is perceived to be of need by the villagers, the headman can inform the higher levels, as well as taking an active role in meeting that need at a village level.

5.5.2 How and When

There are two means that may be employed for reaching women; the formal educational system and the nonformal or informal system. The following outlines the recommendations regarding each based on the findings of this study.

5.5.2.1 Role of Formal Education

The formal educational system can be accessed by women in two ways, at different points in time. The first is directly through their own formal training experiences; the second is indirectly via their children's formal schooling.

The current study suggests that women's environmental education experience through the formal school system was insufficient to deal with the current environmental challenges. Very few of the women recalled learning about the environment in the formal educational system, nor are they likely to enroll as adults. An increase of environmental education within the current educational system may result in the next generation having a better environmental knowledge and practices than present adults.

The following excerpt from the Nation (Section C: Focus-Wed. Aug 28, 1996) reveals the belief that environmental awareness can be achieved through Thai youth:

> *"the path to prevention through public participation is long and arduous. Dissemination of information and on-site activities which would encourage the public to take pride in the natural resources…are inadequate. Most policy makers are of the opinion that the future of the environment lies mainly in the hands of the next generation."*

Though the predominant response in this study was for the headman to be the instigator of environmental education, there were some who viewed children as a source of environmental education. However, the women of Ku Daeng did not necessarily perceive their children as a source of environmental education. This perception may act as a barrier for environmental education needs to be effectively met in this way. Thus it is recommended that though a potential source, children can not be the only source that is relied upon for meeting women's environmental education needs within the village of Ku Daeng. This finding is consistent with the findings of Sutherland and Ham (1992).

5.5.2.2 Role of Informal or Non-formal

Environmental education in developing nations must be linked to human health issues, through the use of existing adult education structures and community development networks (Tudor, 1990-1991). The most effective methods of environmental education may be those that filter instruction through existing value systems in order to elicit emotional responses based on their perceptions with respect to how they view themselves and their environment (Cantrill, 1992; Iozzi, 1989). Four informal or non-formal means that were suggested by participants in the study are: traditional media such as meetings, informal social networks, informal associations, and mass media.

5.5.2.2.1 Traditional Media (meetings)

Meetings were the most popular method that was listed. Though this may have been the case based on respondents' familiarity with this approach, this does not mean that other methods would not be successful. Asking why a method was preferred allowed for an understanding of what qualities the participant would deem as important for any particular method to be effective. The responses indicated that any chosen method would have to enable them to learn better, would be easier to coordinate with respect to time and access, and would allow them to solve the issue together.

5.5.2.2.2 Informal Association (i.e. village groups)

Considering that most of the women did not belong to the women's group, the finding that very few of the women mentioned the women's groups as a discussion arena for environmental issues is expected. This suggests that the women's groups are not the best means of reaching a large number of women. Though for the women that are part of the group, it may still be the most effective means of reaching them.

5.5.2.2.3 Mass Media

Television and radio are media that may be able to play a role in environmental education for Thai village women, especially considering that most of the women in Ku Daeng watch TV in their spare time (refer to Table C-1 in Appendix C). Those who received information through the newspaper had at least four years of education, whereas those with no education, received information through TV, rather than the newspaper. This finding is in agreement with a study by Nyamwange, (1996) which reported, "highly educated individuals are more likely to receive information from newspapers, whereas less educated individual are more likely to receive information from television programs" (p. 21).

One drawback to relying on mass media raised by Cantrill (1992) is that there have been a number of studies that have shown that when people are informed about environmental issues through mass media, they become more passive. This could be an effect in Ku Daeng, and thus must be considered when using mass media as part of an integrated approach to environmental education.

5.5.2.2.4 Informal Social Networks

Friends were referred to by the largest number of women as sources for environmental information. Thus, this would be an appropriate means of reaching a large group of people. Perhaps, it would be possible to consider the TV and radio a as a means of sparking of discussions among groups of friends.

5.6 Conclusions and Recommendations

This exploratory research study conducted in rural Thailand attempted to provide environmental education programming considerations for women in Ku Daeng. This was accomplished by examining both process and content concerns. Process concerns included potential barriers to women's participation, including gender issues, as well as the type of environmental education that would help overcome these barriers. Content concerns involved gaining a better understanding of what women's perceptions were of the environment and environmental issues.

5.6.1 Brief Summary of Recommendations

1. Both men and women need to be considered in environmental education. Just because this study focuses on women, it does not diminish from the need to reach men too.

2. Initially, the headman and the women leaders need to be exposed to environmental education. The villagers felt that the information will need to filter through them first in order to have the greatest effect and the least resistance.

3. Children cannot be relied on as the only source for meeting environmental education needs, as many of the women did not perceive their children to be sources of environmental information. However, that does not mean that children cannot be considered as one source among many sources.

4. The process of environmental education is vital to consider when assessing environmental education needs. How one learns can be as important as what is learned, especially when often the content includes process objectives, as does environmental education, with the focus on critical thinking and action. Any method of environmental education must enable the villagers to learn effectively, be easy to coordinate with respect to time and access and allow them to solve issues together. Part of the process of environmental education could thus include learning the skills required to act collectively. This in many respects makes Action Research and Community Problem Solving (UNESCO, 1993) a potential method of environmental education for Ku Daeng.

5.6.2 Significance of Study and Implications for Future Research

This study was significant for a number of reasons. They can be conceptualized in terms of both the means and the ends of research. The research process itself was drawn from literature from environmental education, sociology, anthropology, rural development, and gender studies. This study was unique from the majority of mainstream environmental education research in that there was a strong qualitative dimension. This study also attempted to consider the historical, social, and political context within which the environment acts on individuals and groups to have meaning, as suggested by Robottom & Hart (1995). This could be accomplished because of the extensive ethnographic work done in the village by researchers like Konrad Kingshill (1960, 1991), Jack Potter (1976) and Sulamith Potter (1977). In terms of the content or research findings, the study provides an overview of women and children's perceptions of environmental issues in a small rural village in Northern Thailand, and provides recommendations for environmental education within the village context, with a consideration of the potential barriers.

This exploratory study lays the ground work for future studies in more conceptual/theoretic applications than what was considered within the scope of this study. Ballantyne & Packer, (1996) have suggested research to analyze, define and map the range of environmental conceptions help by individuals; examine the depth the interrelations among environmental conceptions, knowledge, attitudes/values and behaviour and the impact of different environmental conceptions on learning. Certainly future studies in determining if there are paradigm variances between youth & adults, as well as if any cultural variance exists, which within this study were suggested as areas to further explore, would further augment the knowledge within this area.

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Appendix A: Interview Schedules

A.1 English Interview Schedules for Groups 1-4:

Notes Regarding Interview Schedules:

- For Group 1: The photos which accompany the interview schedule are located in Appendix A.3.2
- For Groups 2&3: The interview schedule for Groups 2 and 3 have different first pages, however they share sections B-F. Section G was for group 3 only. The photos which accompany section E of these interview schedules are located in Appendix A.3.1

PERCEPTIONS OF THE ENVIRONMENT AND OF ENVIRONMENTAL ISSUES.

Group: 1 (6-12yrs.)

Participant #_______ *Moo* # ________Female:☐ Male:☐ Age: ____

Length of time in this village (years) ________ Education (# of years)______ Grade: ___

Name of School:______(public☐ private☐)

Notes:

PART 1

Photo	Like	Dislike	Why
1.			
2.			
3.			
4.			
5.			

PART 2

Photo Set	Which is better? (A or B)	Why
1.		
2.		
3.		
4.		
5.		

PERCEPTIONS OF THE ENVIRONMENT AND OF ENVIRONMENTAL ISSUES.

Group: 2 (13-17 yrs.)

Participant #___ Moo: 6☐ 7☐ Female:☐ Male:☐ Age:_______ Married:☐ Single: ☐

Length of time in this village (years) ________ Education(# of years or Grade) __

Occupation/Name of School and Location(if student): _________ (public☐ private☐)

Notes:

ENVIRONMENTAL PERCEPTIONS:

A: *Definition of term and issues*

1. Name 5 local environmental issues

2. Which of the 5 issues is of most concern to you and why?

3. What should be done to solve this issue?

4. Who should do something about this issue?

5. What education do you think people need to address these environmental issues?

6. Who should teach this?

7. What is the best method of environmental education and why?

PERCEPTIONS OF THE ENVIRONMENT AND OF ENVIRONMENTAL & GENDER ISSUES.

Group: 3 (18+ yrs.) Female Participant #______ Moo: 6☐ 7☐ Age:______

Married:☐ Single: ☐ Length of time in this village (year) ______ Education(# of years) ______

Occupation:______ Notes:

Children	Gender	Age	Surveyed
1.			☐
2.			☐
3.			☐

ENVIRONMENTAL PERCEPTIONS:

A: *Definition of term and issues*

1. Name 5 local environmental issues

2. Which of the 5 issues is of most concern to you and why?

3. What should be done to solve this issue?

4. Who should do something about this issue?

5. What education do you think people need to address these environmental issues?

6. Who should teach this?

7. What is the best method of environmental education and why?

B. *Degree of Attention to Changes in Environment:*

Have you seen any changes in the ________________________ (refer to chart) in and around your village in your lifetime?

	No	Yes	If yes, what has changed?	If yes, when did you first notice this change?	Comments
availability of water					
water cleanness - home					
- canal					
soil productivity - home					
- field					
air cleanness					
amount of plants					
kinds of plants					
amount of animals					
kinds of animals					

Environmental Issue Awareness/Attitude/Action

C. **Water /Soil**

1. What types of things make the local water supply dirty?

2. What do you do or your family members do that may make the water supply dirty?

3. Why is it important to have a clean water supply?

4. What do you do to keep the water supply clean?

5. Where does the local water supply come from?

6. Why are mineral fertilizers useful?

7. When are mineral fertilizers harmful?

8. I use chemicals to control:

		brand name	how often (frequency of use)
1.	rats		
2.	mosquitoes		
3.	ants		
4.	other insects		
5.	fungus/bacteria		
6.	weeds		

9. I use mineral fertilizers for:

	Frequency
house compound	
orchard	
field	

10. What do you use to wash your dishes?

11. What do you use to wash your clothes?

12. I cook with:

	Frequency
charcoal	
LPG gas	
wood	
electric	

13. Of the four, which is the best to cook with and why?

D. Garbage

1. What things does you and your family throw in the garbage?

2. Do you think waste disposal is a problem in Ku Daeng why or why not?

3. Is burning plastic materials good for the air? Explain

4. What happens when plastic is left in the soil?

5. What is the best way of disposing :

		Method	Why?
1.	organic material		
2.	plastic material?		
3.	paper material		
4.	metal material		
5.	batteries		
6.	glass		

6. Is it important to reduce the amount of waste we have? Why or why not?

7. Fill in the following charts:

	Frequency	Where
I burn my garbage		
I dump my garbage		
I bury my garbage		
I reuse plastic bags	never☐sometimes☐often☐	▨
I reuse plastic containers	never☐sometimes☐often☐	▨

8. I usually dispose of waste in the following manner:

		burn	dump	bury	sell
1.	leaves				
2.	plastics				
3.	paper				
4.	organic kitchen wastes				
5.	glass				
6.	metal				

9. List 3 ways of attempting to reduce the amount of waste that gets dumped/burned/buried

E. Describe what you see in the following photos?

Photo	**Issue (state & describe)**	**Positive Aspects**	**Negative Aspects**	**How can you improve this?**	**Is there anything else you can do?**	**Why does this problem still exist?**

F. SOURCES OF ENVIRONMENTAL INFORMATION:

1. In school, did/do you learn about issues like we discussed earlier? Yes☐ No☐

   i. If yes, what can you tell me about the issues you learned about?

2. How do you get information about the issues we've been talking about.

	never	*sometimes	*often
I read the newspaper			
I watch television			
I listen to the radio			
I read magazines			
I discuss these issues			

X

* If "sometimes" or "often" for any of the above: document in X, the names of newspapers, radio stations, magazines, with whom discussed issues (i.e. husband, children, friends, neighbours, etc...)

3. Do you belong to a group where these environmental issues are discussed? Yes☐ No☐

   If yes, which one(s)?

4. Do you belong to the village: Women's group? Yes☐ No☐ N/A ☐

   Youth Group:? Yes☐ No☐ N/A ☐

Background data box filled in ☐

G. OTHER (GROUP 3 ONLY):

1. Do you have personal time in the evening? Yes☐ No☐ (if yes skip question 2)
2. What factors influence your having no personal time?

3. Do you have free time to :

	Activity	frequency (per day, month, or year)		Activity	frequency (per day, month, or year)
1.	see movies		6.	talk together as a family	
2.	go to the town		7.	talk together with your husband	
3.	visit relatives		8.	talk together with your children	
4.	visit friends		9.	take trips	
5.	watch TV		10	make kanom(deserts)	

4. Please state if you agree or disagree with the following statements and explain:

	Statement	***A**	***D**	**Explain**
1.	A man should choose who he will marry.			
2.	A women should choose who she will marry.			
3.	When a women marries she must take her husband's family name.			
4.	A women would make a good village headman.			
5.	It is better if a wife has a higher education level than her husband.			
6.	A wife can make decisions about whether to become pregnant			
7.	A wife with another man is worse than a husband with a second wife.			

* A=agree D= disagree

SOCIAL CHANGES IN KU DAENG

Group: 4 (50+ yrs.)

Participant #____ Moo: 6☐ 7☐ Female:☐ Male:☐ Age:____ Married:☐ Single: ☐

Length of time in this village (years) _____ Education (# of years)_____ Occupation:___________

Notes:

GENDER ROLES /ATTITUDES

1. Name 5 occupations of people in Ku Daeng now.

2. Name 5 occupations women should do?

3. Name 5 occupations men should do?

4. Name 5 occupations both should do?

5. Who keeps your family money?

6. Do you use your family money?

7. What do you use your family money to buy?

8. When can you use your family money?

9. Where can you use your family money?

10. Who owns land in your family?

11. Who decides how to use the land?

12. Do you use the land?

13. What do you use the land for?

14. Who decided how many children you would have?

15. Please state if you agree or disagree with the following statements and explain:

	Statement	***A**	***D**	**Explain**
1.	A man should choose who he will marry.			
2.	A women should choose who she will marry.			
3.	When a women marries she must take her husband's family name.			
4.	A women would make a good village headman.			
5.	It is better if a wife has a higher education level than her husband.			
6.	A wife can make decisions about whether to become pregnant			
7.	A wife with another man is worse than a husband with a second wife.			

* A=agree D= disagree

16. In Ku Daeng , whom does these activities now? Activity Absent=0, Present=X, Strong=XX
* (children are those <15yrs, please specify if activity by only boys or only girls)

#	Activity	M	W	*Children	Additional Comments
1.	Attending temple rites				
2.	Barber				
3.	Basketry				
4.	Buying and selling land				
5.	Buying and selling buffalo, cattle				
6.	Buying pigs				
7.	Buying household goods, clothes, etc...				
8.	Bicycle riding				
9.	Caring for babies				
10.	Caring for buffaloes, cattle				
11.	Cleaning or digging ditches				
12.	Cleaning house				
13.	Carrying women's undergarments (used)				
14.	Climbing tall trees				
15.	Cock fighting				
16.	Coffin bearer				
17.	Cutting firewood				
18.	Drawing water				
19.	Drinking Alcoholic beverages				
20.	Fishing with net on bamboo pole				
21.	Fishing with rod				
22.	Fishing with throw-net				
23.	Fishing with traps				
24.	Fishing with spears				
25.	Fishing with bamboo shovels				
26.	Gambling (dice, cards)				
27.	Gambling (lottery)				
28.	General laundry				
29.	Headman or Kamnan				
30.	Hoeing fields				
31.	Keeping pigs, poultry				
32.	Loaning money				
33.	Making mats				
34.	Operating farm				
35.	Ownership of land				
36.	Piecing ears for earrings				
37.	Playing in orchestra				
38.	Playing ta krau, checkers				
39.	Plowing, harrowing				
40.	Polygamist				
41.	Preparing fish				
42.	Preparing food				
43.	Preparing food for temple rites				
44.	Presenting food to priests				
45.	Reaping (cutting rice)				

#	Activity	M	W	*Children	Additional Comments
46.	School teacher				
47.	Selling surplus rice				
48.	Selling rice in market (milled rice)				
49.	Selling pigs				
50.	Sewing cloth				
51.	Sewing netting				
52.	Shoveling water				
53.	Slaughtering poultry				
54.	Sowing rice				
55.	Storekeeper				
56.	Sweets seller				
57.	Taking care of household Buddha shrine				
58.	Taking food to temple				
59.	Taking rice to market (paddy)				
60.	Taking rice to rice-mill				
61.	Temple committee				
62.	Threshing				
63.	Traditional doctor				
64.	Undertaker				
65.	Use of guns, crossbows				
66.	Vegetable gardens				
67.	Village Meeting				
68.	Wearing charms				
69.	Wearing jewelry				
70.	Weeding rice fields				
71.	Winnowing (throwing rice in air)				
72.	Winnowing (fanning)				
73.	Driving Car				
74.	Driving Truck				
75.	Making Jewelry				
76.	Owning Business				
77.	Riding Motorcycle				
78.	Voting				
79.	Laundry Service				
80.	Make Bricks				
81.	Dry Longans				
82.	Grow Mushrooms				
83.	School Truck Driver				
84.	Sell Gas				
85.	Sell LPC Gas				
86.	Work in Factory (labouror)				
87.	Merchant				
88.	Mechanic				
89.	Store worker				

Background data box filled in ☐

A.2 Thai Interview Schedules for Groups 2-4:

กลุ่ม 2 (13-17 ปี)
ผู้ร่วมฯ.............หมู่ ( ) 6 ( ) 7 ( ) หญิง ( ) ชาย อายุ............. ( ) แต่งงาน ( ) โสด
ระยะเวลาที่อาศัยอยู่ในหมู่บ้าน...........ปี การศึกษา (ปีที่ หรือ ระดับ)........................
ชื่อโรงเรียนและสถานที่ตั้ง..[( ) รัฐบาล ( ) เอกชน]
หมายเหตุ:

A. ความรับรู้และความเปลี่ยนแปลง

1. สภาพแวดล้อมที่เป็นปัญหาในหมู่บ้านเรามีอะไรบ้าง พอบอก 5 ข้อ ?

1...
2...
3...
4...
5...

2. ปัญหาที่เกิดขึ้นอะไรสำคัญที่สุดในความคิดของคุณ? ทำไม?

....
....

3. ในปัญหาที่คุณคิดว่าสำคัญ เราจะแก้ไขได้อย่างไร?

....
....

4. ใครบ้างที่จะแก้ปัญหาที่เกิดขึ้นนั้น

....
....

5. การศึกษาของคนระดับใดที่จะแก้ไขปัญหาสิ่งแวดล้อมได้

....
....

6. ใครควรจะเป็นผู้สอนเรื่องสิ่งแวดล้อม

....
....

7. วิธีการสอนวิธีไหนดีที่สุด และทำไมท่านคิดว่าเป็นวิธีที่ดีที่สุด?

....
....

กลุ่ม 3 (18 ปีขึ้นไป) **ผู้ร่วมผู้หญิง #**..............................

หมู่ ( ) 6 ( ) 7 อายุ.............. ( ) แต่งงาน ( ) โสด

ระยะเวลาที่อาศัยอยู่ในหมู่บ้าน..........ปี **การศึกษา (ปีที่ หรือ ระดับ)**.........................

อาชีพ..

หมายเหตุ:

Children	เพศ	อายุ	การสำรวจ
1.			[ ]
2.			[ ]
3.			[ ]

A. ความรับรู้และความเปลี่ยนแปลง

1. สภาพแวดล้อมที่เป็นปัญหาในหมู่บ้านเรามีอะไรบ้าง พอบอก 5 ข้อ ?

1...

2...

3...

4...

5...

2. ปัญหาที่เกิดขึ้นอะไรสำคัญที่สุด ในความคิดของคุณ? ทำไม?

....

....

3. ในปัญหาที่คุณคิดว่าสำคัญ เราจะแก้ไขได้อย่างไร?

....

....

4. ใครบ้างที่จะแก้ปัญหาที่เกิดขึ้นนั้น

....

....

5. การศึกษาของคนระดับใดที่จะแก้ไขปัญหาสิ่งแวดล้อมได้

....

....

6. ใครควรจะเป็นผู้สอนเรื่องสิ่งแวดล้อม

....

....

7. วิธีการสอนวิธีไหนดีที่สุด และทำไมท่านคิดว่าเป็นวิธีที่ดีที่สุด?

....

....

B. ความเปลี่ยนแปลงในสิ่งแวดล้อม

เดี๋ยวนี้คุณทราบถึงความเปลี่ยนในด้าน..............................รอบ ๆ หมู่บ้านคุณ ในช่วงชีวิตของคุณหรือไม่

	ไม่ใช่	ใช่	ถ้าใช่อะไรเปลี่ยน	ถ้าใช่รู้ว่าเปลี่ยนตอนไหน	หมายเหตุ
1. แหล่งน้ำ					
2. ความสะอาดของน้ำ - บ้าน					
- คลอง					
3. คุณภาพของดิน - บ้าน					
- ไร่					
4. อากาศบริสุทธิ์					
5. ปริมาณพืชผัก					
6. ชนิดของพืช					
7. ปริมาณสัตว์เลี้ยง					
8. ชนิดของสัตว์เลี้ยง					

C. การรับรู้ ทัศนคติ ที่มีต่อสิ่งแวดล้อม

น้ำ ดิน

1. มีอะไรบ้างที่ทำให้น้ำสกปรก

....

....

2 คุณหรือคนในครอบครัวทำให้น้ำสกปรก หรือไม่อย่างไร

....

....

3. ทำไมทุกคนต้องการแหล่งน้ำสะอาด

....

....

4. คุณมีส่วนร่วมให้เกิดแหล่งน้ำสะอาดได้อย่างไรบ้าง

....

....

5 น้ำที่ใช้ในหมู่บ้านมาจากไหน

....

....

6 ทำไมปุ๋ยเคมีมีประโยชน์

....

7. ทำไมปุ๋ยเคมีมีอันตราย

8. ใช้สารเคมีเพื่อควบคุม

		ชื่อการค้า	ใช้กี่ครั้ง (ความถี่)
1.	หนู		
2.	ยุง		
3.	มด		
4.	แมลงอื่น ๆ		
5.	เชื้อรา/แบคทีเรีย		
6.	วัชพืช		

9. ใช้ปุ๋ยเพื่อ

		บ่อยครั้ง
1.	รอบ ๆ บ้าน	
2.	สวนต่าง ๆ	
3.	อื่น ๆ	

10. ใช้อะไรในการล้างจาน

11. ใช้อะไรในการซักผ้า

12. ทำอาหารโดย

	ความถี่ (ปริมาณครั้ง)		ความถี่ (ปริมาณครั้ง)
ถ่าน		ไม้	
ก๊าซหุงต้ม		ไฟฟ้า	

13. ในสี่ตัวนี้ อะไรใช้ทำอาหารดีที่สุด และทำไม

D. ขยะ

1. คุณและครอบครัวของคุณทิ้งอะไรบ้างลงในถังขยะ

2. ในหมู่บ้านเรามีปัญหาในการทิ้งขยะหรือไม่ ทำไม

3. การเผาขยะและพลาสติกดีสำหรับอากาศไหม อธิบาย

....

....

4. อะไรจะเกิดขึ้นถ้าถุงพลาสติกถูกทิ้งในดิน

....

....

5. วิธีไหนเป็นวิธีที่ดีที่สุดในการทิ้งขยะ ทำไม

	วิธี	ทำไม
5.1 อินทรีย์วัตถุ (เน่า, เปื่อยได้)		
5.2 วัสดุพลาสติก		
5.3 วัสดุกระดาษ		
5.4 วัสดุเหล็ก		
5.5 ถ่านไฟฉาย		
5.6 แก้ว		

6. มีความจำเป็นไหมที่จะลดปริมาณขยะที่มีอยู่ ทำไม

....

....

7. เติมใน Chart

	ความถี่	ที่ไหน
คุณเผาขยะ		
คุณทิ้งขยะ		
คุณฝังขยะ		
คุณใช้ถุงพลาสติกอีกครั้งไหม	ไม่ ( ) บางครั้ง ( ) บ่อยครั้ง ( )	▨
คุณใช้กล่องพลาสติกอีกครั้งไหม	ไม่ ( ) บางครั้ง ( ) บ่อยครั้ง ( )	▨

8. คุณทิ้งขยะโดยวิธี

		ทิ้ง	เผา	ฝัง	ขาย
1.	ใบไม้				
2.	พลาสติก				
3.	กระดาษ				
4.	ขยะในห้องครัว				
5.	แก้ว				
6.	เหล็ก				

9 บอก 3 วิธีที่สามารถที่ลดปริมาณขยะ นอกจากการทิ้ง เผา ฝัง

E. ตอบคำถามภาพถ่าย

ภาพที่	ดี หรือ ไม่ดี	ปรับปรุงสิ่งที่เกิดขึ้นได้อย่างไร	มีอย่างอื่นบ้างไหมที่คุณทำได้	ทำไมเหตุการณ์เช่นนี้จึงมีอยู่
1				
2				
3				
4				
5				

F. **แหล่งกำเนิดของข้อมูลสิ่งแวดล้อม**

1. ในโรงเรียนได้มีการเรียนเรื่องสิ่งที่เราได้คุยกันมาก่อนนี้หรือไม่

( ) ใช่ ( ) ไม่ ( ) ถ้าใช่ คุณสามารถบอกได้ไหมว่าคุณเรียนรู้อะไรบ้าง

....

....

2. คุณได้ข้อมูลในเรื่องสิ่งแวดล้อมที่เราคุยถึงที่ไหน

	ไม่เคย	บางครั้ง	บ่อยครั้ง	X
คุณอ่านหนังสือพิมพ์				
คุณดูทีวี				
คุณฟังวิทยุ				
คุณอ่านหนังสือนิยศาสตร์				
(โลกดารา, หนังสือดารา)				
คุณเคยคุยเรื่องสิ่งแวดล้อม				

3. คุณอยู่ในกลุ่มที่มีการคุยกันเรื่องสิ่งแวดล้อมหรือไม่ ( ) ใช่ ( ) ไม่ ถ้าใช่ กลุ่มไหน

4. คุณเป็นสมาชิกในกลุ่ม แม่บ้านหรือไม่ ( ) ใช่ ( ) ไม่
คุณเป็นสมาชิกในกลุ่ม เยาวชนหรือไม่ ( ) ใช่ ( ) ไม่

G. เฉพาะกลุ่ม 3

1. คุณมีเวลาว่างที่จะทำอะไรเป็นการส่วนตัวในเวลาเย็นไหม มี ( ) ไม่มี ( ) (ถ้ามีให้ข้ามไปตอบข้อ 3)

2. ถ้าไม่มี เป็นเพราะเหตุใด

....

....

3. คุณมีเวลาว่างที่จะทำ

	ความบ่อยครั้ง		ความบ่อยครั้ง
3.1 ดูหนัง		3.6 พูดคุยกับสมาชิกในครอบครัว	
3.2 ไปในเวียง		3.7 พูดกับสามี	
3.3 เยี่ยมญาติ		3.8 พูดกับลูก ๆ	
3.4 เยี่ยมเพื่อน		3.9 เดินทางท่องเที่ยว	
3.5 ดูทีวี		3.10 ทำขนม	

4. ให้ตอบคำถาม เห็นด้วยหรือไม่เห็นด้วย

		เห็นด้วย	ไม่เห็นด้วย	ทำไม
1	ผู้ชายควรที่จะเป็นคนเลือกคู่ครองว่าจะแต่งงานกับใคร			
2.	ผู้หญิงควรที่จะเป็นคนเลือกคู่ครองว่าจะแต่งงานกับใคร			
3.	เมื่อแต่งงานแล้วผู้หญิงจำเป็นหรือไม่ที่ใช้นามสกุลของผู้ชาย			
4.	ผู้หญิงน่าจะเป็นผู้ใหญ่บ้านที่ดี			
5	จะคิดว่าไหมที่ภรรยาจะเรียนสูงกว่าสามี			
6 .	ภรรยาสามารถที่จะตัดสินใจว่าจะยอมให้ตั้งครรภ์หรือไม่ยอม			
7	ภรรยามีชู้เลวร้ายกว่าสามีมีเมียน้อย			

กลุ่มที่ 4 (50 ปีขึ้นไป)
ผู้ร่วม # .... หมู่ ( ) 6 ( ) 7 ( ) หญิง ( ) ชาย อายุ......... ( ) แต่งงาน ( ) โสด
ระยะเวลาที่อาศัยอยู่ในหมู่บ้าน (ปี).................... การศึกษา (ปีที่).......... อาชีพ...............
หมายเหตุ:

ถามเรื่องการเปลี่ยนแปลงในสังคม

1. ในหมู่บ้านของเรามีอาชีพอะไรบ้าง บอกมาสัก 5 อาชีพ

2. ให้บอกว่า 5 อาชีพที่ผู้หญิงควรทำ

3. ให้บอกว่า 5 อาชีพที่ผู้ชายควรทำ

4. ให้บอกว่า 5 อาชีพทั้งผู้หญิง-ผู้ชาย ควรทำ

5. ในครอบครัวใครเป็นผู้เก็บเงิน

6. คุณใช้เงินที่เก็บในครอบครัวหรือไม่

7. คุณใช้เงินไปซื้ออะไรบ้าง

8. เมื่อไรที่คุณสามารถใช้เงินที่เก็บในครอบครัว

9. คุณสามารถใช้เงินที่เก็บในครอบครัวได้ที่ไหนบ้าง

10. ใครเป็นผู้ถือครองที่ดินของครอบครัว

11. ใครเป็นคนตัดสินใจในการใช้ที่ดิน

12. คุณใช้ที่ดินหรือไม่

13. คุณใช้ที่ดินทำอะไร

14 ใครเป็นคนตัดสินใจว่าควรที่จะมีลูกกี่คน

15 ให้ตอบคำถาม เห็นด้วยหรือไม่เห็นด้วย

		เห็นด้วย	ไม่เห็นด้วย	ทำไม
1	ผู้ชายควรที่จะเป็นคนเลือกคู่ครองว่าจะแต่งงานกับใคร			
2	ผู้หญิงควรที่จะเป็นคนเลือกคู่ครองว่าจะแต่งงานกับใคร			
3.	เมื่อแต่งงานแล้วผู้หญิงจำเป็นหรือไม่ที่ใช้นามสกุลของผู้ชาย			
4.	ผู้หญิงน่าจะเป็นผู้ใหญ่บ้านที่ดี			
5	จะดีกว่าไหมที่ภรรยาจะเรียนสูงกว่าสามี			
6	ภรรยาสามารถที่จะตัดสินใจว่าจะยอมให้ตั้งครรภ์หรือ ไม่ยอม			
7.	ภรรยามีชู้เลวร้ายกว่าสามีมีเมียน้อย			

16 กิจกรรม เดี๋ยวนี้

	ชาย	หญิง	เด็กต่ำกว่า 15 ปี
1. ไปวัด			
2. ช่างตัดผม			
3. ทำเครื่องจักรสาน			
4. ซื้อขายที่ดิน			
5. ซื้อขายวัว ควาย			
6. ซื้อหมู			
7. ซื้อสิ่งของใช้ในบ้าน เสื้อผ้า			
8. ขี่จักรยาน			
9. ดูแลเด็กอ่อน			
10. ดูแลวัว ควาย			
11. ทำความสะอาดหรือขุดล่องระบายน้ำ			
12. ทำความสะอาดบ้าน			
14. ปีนต้นไม้สูง ๆ			
15. ขนไก่			
16. แบกหีบศพ			
17. ตัดฟืน			

	ชาย	หญิง	เด็กต่ำกว่า 15 ปี
18 ตักน้ำ			
19 ต้มเหล้า			
20 จับปลาด้วยมอง (ยอ)			
21 ตกเบ็ดด้วยไม้ไผ่			
22 ทอแห			
23 ตัดไม้			
24 หุงอาหาร			
25 จักสาน			
26 เล่นการพนัน (ลูกเต๋า, ไพ่)			
27 เล่นหวย			
28 ซักผ้า			
29 กำนัน หรือผู้ใหญ่บ้าน			
30 ขุดดิน			
31 เลี้ยงหมู เป็ด ไก่			
32 กู้ยืมเงิน			
33 ดูแลเด็ก			
34 ทำไร่ทำสวน			
35 เจ้าของที่ดิน			
36 [illegible]			
37 คณะแห่ วงดนตรี			
38 เล่นตะกร้อ และหมากรุก			
39 ถางหญ้า เตรียมดิน			
40 ระหว่างผู้หญิงกับผู้ชายใครควรจะมีคู่ครองหลายคน (ในหมู่บ้านเท่านั้น)			
41 เตรียมปลา (เพื่อทำอาหาร)			
42 เตรียมอาหาร			
43 เตรียมอาหารไปวัดในวันพระ			
44 ถวายอาหารให้พระ			
45 เกี่ยวข้าว			
46 ครู			
47 ขายข้าวเปลือก			
48 ขายข้าวสารในตลาด			
49 ขายหมู			
50 ตัดเสื้อผ้า			
51 ตัดผม			
52 วิดน้ำลงนา			
53 ฆ่าไก่			
54 ปลูกข้าว			
55 เลี้ยงดูทารกแรกเกิด			
56 ขายขนม			
57 ดูแลหิ้งพระ			
58 เอาอาหารไปวัด			
59 นำข้าวเปลือกไปที่ตลาด			
60 เอาข้าวเปลือกไปโรงสี			
61 เป็นกรรมการวัด			
62 นวดข้าว			
63 แพทย์แผนโบราณ			
64 ตำน้ำพริก			
65 ใช้เงินและหนี้สิน			
66 ทำสวนผัก			
67 ประชุมในหมู่บ้าน			
68 ใส่เครื่องรางของขลัง			
69 ใส่เครื่องประดับ			
70 ถอนหญ้าในนา			
71 ไล่ข้าว			
72 วีข้าว			
73 ขับรถยนต์			
74 ขับรถบรรทุก			
75 [illegible]			
76 ธุรกิจส่วนตัว			
77 ขับขี่มอเตอร์ไซค์			
78 ลงคะแนนเลือกตั้ง			
79 บริการจัดงาน			
80 ปั้นตุ๊กตา (ดินเผา)			
81 ตกลำไย			
82 เพาะเห็ดฟาง			
83 ช่างกลึงเหล็ก			
84 ขายน้ำมัน			
85 ขายผลิตภัณฑ์			
86 ทำงานในโรงงาน			
87 ตัดเย็บ			
88 ช่างซ่อมเครื่องยนต์			
89 พนักงานขายของหน้าร้าน			

A.3 Photos that accompany interview schedules for groups 1-3

A.3.1 Groups 2 and 3 Section E Photos

Photo A-1 Photo A-Dirty Canal

Photo A-2: Photo B -Separating Garbage

Photo A-3: Photo C-Bottles in Longan Orchard

Photo A-4: Photo D-Common Land Dump

Photo A-5: Photo E-Roundup Herbicide

Photo A-6: Photo F-Burning Leaves

Photo Credits: J. Varghese

Photo Credits: J. Varghese

Photo A-7: Photo G-Dumped Leaves

A.4.1 Group 1Photos

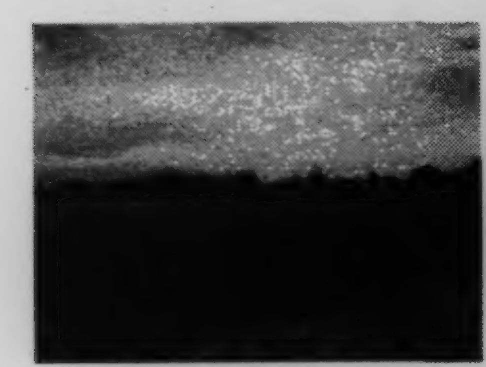


Photo A-8: Part 1 Set 1-Tall Grass

Photo A-9: Part 1 Set 2-Burned Dump by Water

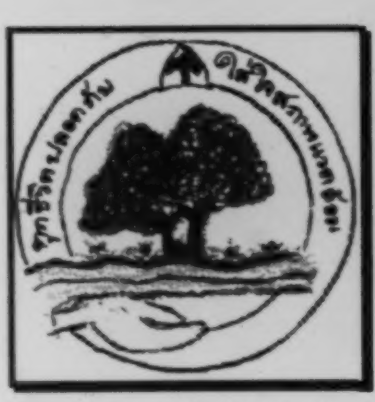


Photo A-10: Part 1 Set 3-Enviro-Symbol

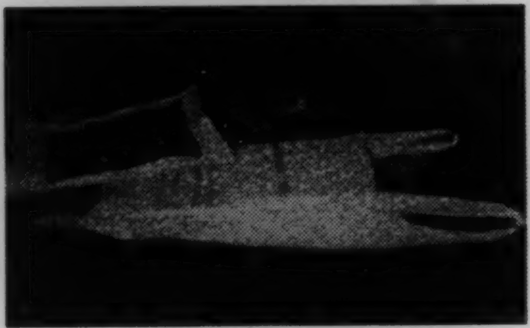


Photo A-11 Part 1 Set 4-Washed Plastic Bags

Photo Credits: J. Varghese

Photo A-12:Part 1 Set 5-Burning Garbage

Photo A-13: Part 2-Set 1A-Dirty Canal

Photo A-14: Part 2-Set 1B-Clean Canal Side

Photo A-15: Part 2-Set 2A-Dump on Common Land

Photo A-16: Part 2-Set 2B-Wet & Dry Separation

Photo A-17: Part 2-Set 3A-Dumping Leaves

Photo A-18: Part 2-Set 3B-Burning Leaves

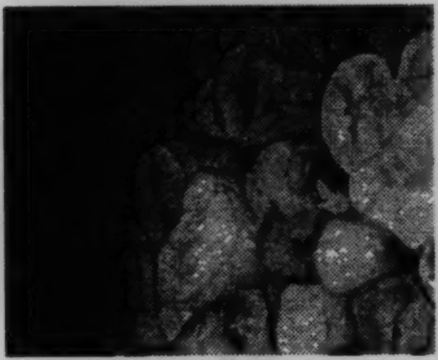


Photo A-19 Part 2-Set 4A-Firewood

Photo A-20: Part 2-Set 4B-Gas

Photo A-21: Part 2-Set 5A-Paper Bags

Photo A-22: Part 2-Set 5B-Plastic Bags

Photo Credits: J. Varghese

A.4 Sample of Interview guide used for Informal Interviews

PERCEPTIONS OF THE ENVIRONMENT AND OF ENVIRONMENTAL ISSUES.
Interview Guide:

Definition of the Term "Environment":

Many describe the term environment in many different ways. I am interested in learning about the working definition of the term within this village.

Could you describe for me how you define the term environment"?.

1. How things have changed over time?
2. Overall would you say most of the changes have been positive on negative?
3. How have the local environmental issues changed over time?
4. Name 5 local environmental issues
5. Which of the 5 issues is of most concern to you and why?
6. What should be done to solve this issue?
7. Who should do something about this issue?
8. What education do you think people need to address these environmental issues?
9. Who should teach this?
10. What is the best method of environmental education and why?

Notes:

Generic Probes:

who
what
where
how
why

example
clarify
elaborate
describe

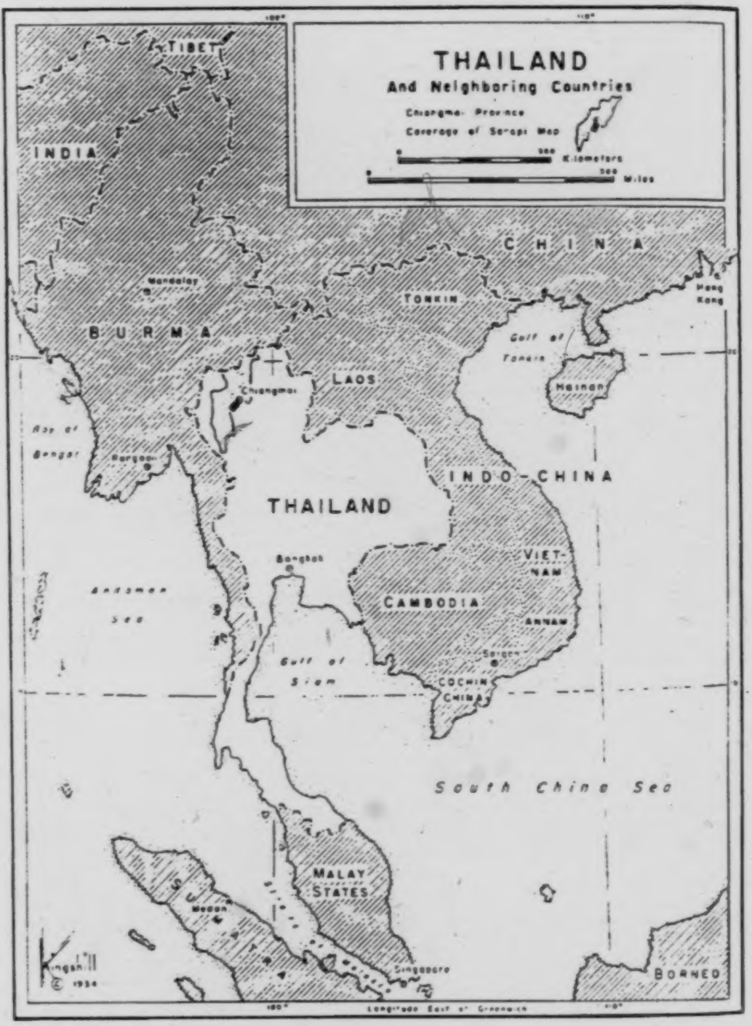
senses
touch
smell
hear
taste
see

feel
think

Demographics:

age:
education(# years):
residency (# years):
Date:
Time:

Appendix B: Maps

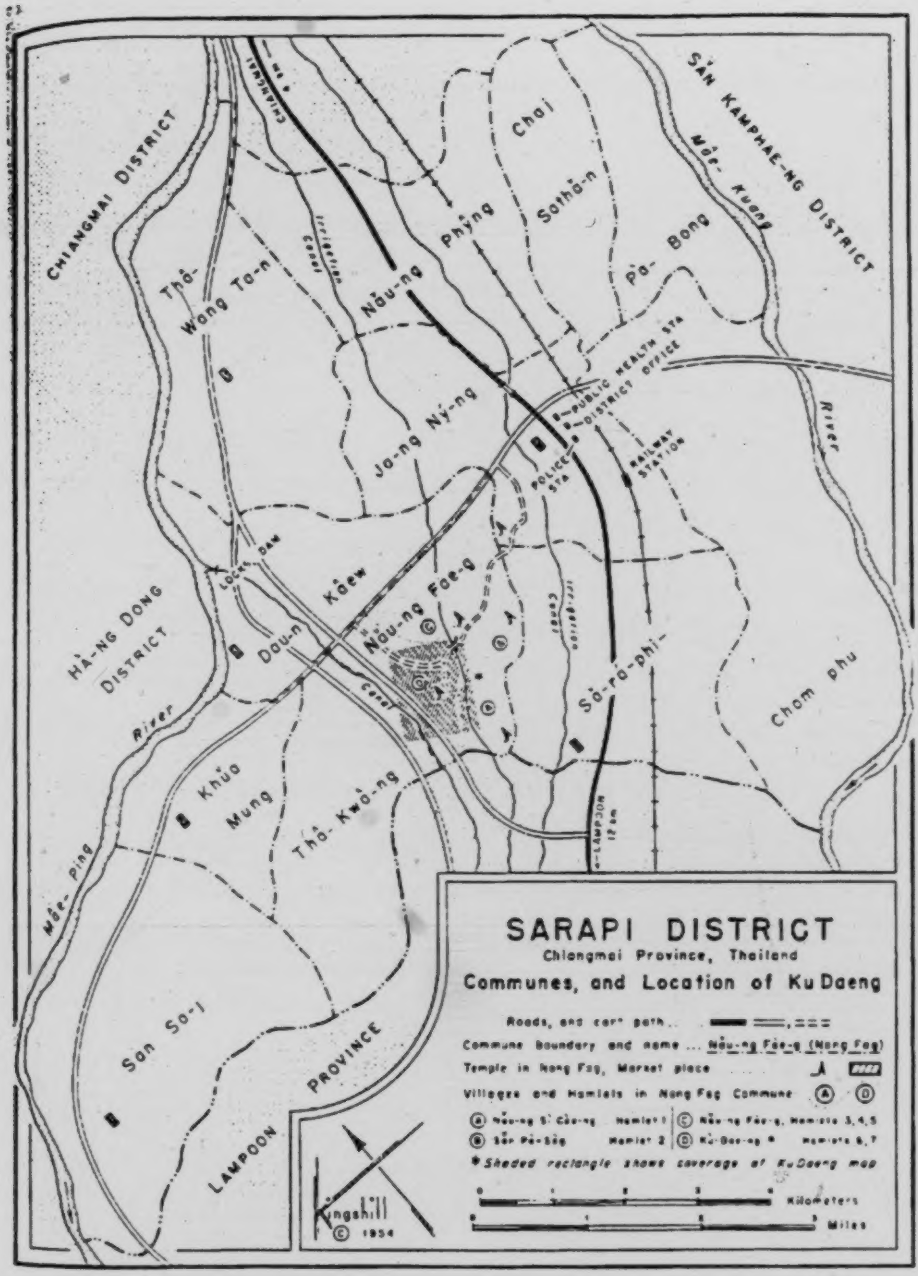

THAILAND
And Neighboring Countries
Chiangmai Province
Coverage of Sarapi Map
0
500 Kilometers
0
300 Miles
100°
110°
TIBET
INDIA
CHINA
Mandalay
TONKIN
Hong Kong
BURMA
Gulf of Tonkin
Hainan
Chiangmai
LAOS
Bay of Bengal
Rangoon
INDO-CHINA
THAILAND
Bangkok
VIET-NAM
Andaman Sea
CAMBODIA
ANNAM
Saigon
Gulf of Siam
COCHIN CHINA
South China Sea
MALAY STATES
Medan
SUMATRA
Singapore
BORNEO
Kingshill © 1954
Longitude East of Greenwich

Drawn by James R. Wray

Map 1

Source: Kingshill (1991:251)

Figure B-1: Location of Sarapi District in Relation to Thailand

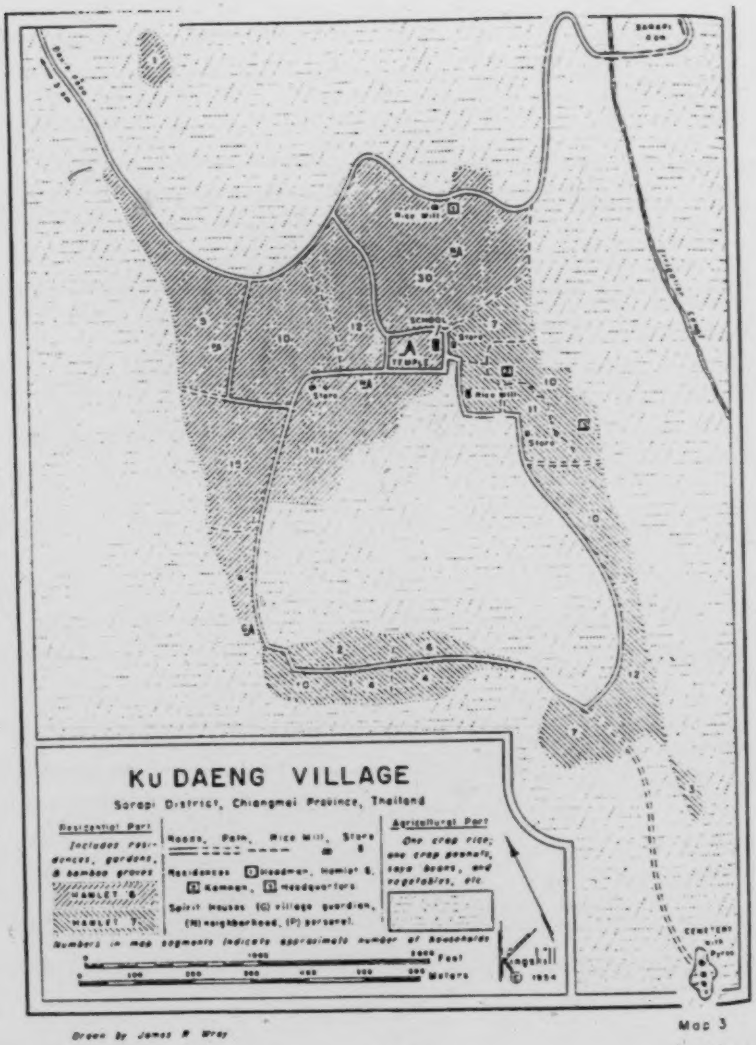

SARAPI DISTRICT
Chiangmai Province, Thailand
Communes, and Location of Ku Daeng
Roads, and cart path
Commune boundary and name ... Nǒu-ng Fǎe-g (Nong Fag)
Temple in Nong Fag, Market place
Villages and Hamlets in Nong Fag Commune
Ⓐ Nǒu-ng S. Cǎo-ng Hamlet 1
Ⓑ Sǒn Pa-Sǎg Hamlet 2
Ⓒ Nǒu-ng Fǎe-g, Hamlets 3, 4, 5
Ⓓ Ku-Dae-ng * Hamlets 6, 7
* Shaded rectangle shows coverage of Ku Daeng map
0 1 2 3 4 Kilometers
0 1 2 3 Miles
Kingshill © 1954
CHIANGMAI DISTRICT
SǍN KAMPHAE-NG DISTRICT
HǍ-NG DONG DISTRICT
LAMPOON PROVINCE
Chai
Sothǒ-n
Pa- Bong
Phyng
Nǒu-ng
Thǒ-
Wong Ta-n
Ja-ng Ny-ng
Dou-n Kǎew
Nǒu-ng Fae-g
Sǒ-ra-phi-
Chom phu
Khǔa Mung
Thǒ- Kwǒ-ng
Sǒn Sa-i
Mǎe- Kuang River
Mǎe- ping River
Irrigation Canal
Canal
LOCK DAM
PUBLIC HEALTH STA
DISTRICT OFFICE
POLICE STA
RAILWAY STATION
LAMPOON 12 km

Drawn by James R. Wray

Map 2

Source: Kingshill (1991:252)

Figure B-2: Location of Ku Daeng in Relation to Sarapi District


KU DAENG VILLAGE
Sarapi District, Chiangmai Province, Thailand
Residential Part
Includes residences, gardens, & bamboo groves
HAMLET 6
HAMLET 7
Roads, Path, Rice Mill, Store
Residences Headman, Hamlet 6, Kamnan, Headquarters
Spirit Houses (G) village guardian, (N) neighborhood, (P) personal.
Agricultural Part
One crop rice; one crop peanuts, soya beans, and vegetables, etc.
Numbers in map segments indicate approximate number of households
0
1000
2000 Feet
0
100
200
300
400
500
600 Meters
Kingshill © 1954
Drawn by James R Wray
Map 3
TEMPLE
SCHOOL
Rice Mill
Store
CEMETERY

Source: Kingshill (1991:253)

Figure B-3: Map of Ku Daeng

Appendix C: Results

C.1 Supplementary Tables

Table C-1: Local Environmental Issues

	Issues raised by:		Freq.	Most Important issue raised by group:		
Issue	**Youth**	**Women**	**Total**	**Youth**	**Women**	**Both**
NATURAL ENVIRONMENT						**74**
Land			**2**			
land					2	2
less rice fields	1	1	2		1	1
Water						
water		1	1		1	1
quantity of water		4	4			
water availability					1	1
floods	1	7	8	2	13	**15**
drought		2	2		4	4
quality of water		4	4		1	1
water pollution	3	11	14	3	15	**18**
water smells	1	1	2	1	1	2
stagnant water	2	7	9	1	1	2
Air/Temp						
air pollution		2	2			
hotter temperatures		4	4		1	1
fluctuating temperatures		1	1			
Soil						
soil		5	5	1	2	3
Flora/Fauna						
deforestation	1	2	3			
weeds/grass		1	1			
fauna					6	1
mosquitoes		8	8			6
stray dogs		1	1			
fish		1	1			
SOCIAL ENVIRONMENT						**34**
bad roads	4	11	15		5	5
too many cars		1	1			
insufficient electricity		1	1		1	1
waste disposal	3	11	14	3	10	**13**
drugs	1		1			
# Respondents who listed issues			51			80
Total Respondents	11		84	11	66	84

Table C-2: Ways to Reduce Waste that gets Burned, Dumped or Buried

	Youth	Women	Total
decrease consumption		3	3
recycle, reuse, sell	9	12	21
fertilizer		3	3
government pickup		2	2
can't think of any, don't know, none or no	2	40	42
no better alternative		5	5

C.2 Description of Variables Used in Linear Regression and Supporting Documentation For The Analysis.

Marital status, age, level of education attained, whether their occupation was linked to agriculture, their occupational status, that hamlet of residence, village residency and the number of children were the variables used. These variables were chosen based on availability of data and parameters identified in the literature. The variables were analysed using a multiple linear regression model. Coefficient correlation and correlation diagnostics were also determined to test for multicolinearity.

Some of the variables were transformed to make it easier to use in the analysis. Marital status, *moo* and agricultural occupation were dummy variables. Agricultural occupation was created by recoding the occupation variable according to whether the occupation was agriculturally related or not. The age and education of the respondents were recoded into age groupings and educational levels respectively, using the midpoints of each category as the assigned value. The village residency was recoded into ten year intervals, as above, midpoints were the assigned values given. A preliminary scatterplot of the independent and dependent variables were used to show linearity. In a few cases this was easy to see, but in most of the cases, it was more difficult. Thus line graphs of the means of the independent variables against the index variables were used to determine if a case could be made for linearity.

Description of Variables

The predicted directions of change for each of the dependent variables are included in Table C-3.

Table C-3: Predicted Direction of Influence of Independent Variables on Dependent Variable.

	marital status	age	education level	agricultural occupation	occupational status	*moo*	village residency	# children
water	-	+	-	-	+/-	+/-	-	-
soil	-	+	-	-	+/-	+/-	-	-
air	-	+	-	-	+/-	+/-	-	-
plants	-	+	-	-	+/-	+/-	-	-
animals	-	+	-	-	+/-	+/-	-	-

Based on the coding of the interval data, the dependent variables were ranked in reverse. The smaller number is "better" than the higher number. Based on this approach, it becomes possible to state that a smaller number is an indication of a higher perception of environmental changes, assuming that the intervals are a good measure of that. Since the investigator cannot say that this is the type of change that should be noticed as there is no accurate ruler, she could only use data whether the respondents pay attention to changes or not and if they do, when such changes were noticed.

Following is a description of the dependent variables and the direction that was hypothesized with respect to how the effects that each of the independent variables would have on the dependent variable and potential reasoning behind the prediction.

Dependent variables:

By the time the analysis was completed, the regressions were run a numerous of times. The variables are a measure of the degree of attention to changes in a particular component of the environment. For example, the one for air is a measure of the degree of attention to changes in air quality. For the dependent variables, the lower the number, the higher the overall awareness of change in the environment.

The dependent variables which measured time intervals in which change was noticed, were coded in such a way that the more recent intervals were given an smaller number. "No change" observed was coded as 10 higher than the highest possible interval group. If those who felt no change had occurred had been excluded, many of the cases would have been eliminated. The fact that they stated "no change", is just as vital as the interval in which those who saw the change saw it in.

Independent Variables:

Marital status is a dummy variable, where: single is zero, and 1 is married. The direction of the prediction for marital status was negative, thus the higher the number the more likely to have a higher perception of change (thus lower dependent variable values). As one gets married they are required to "take care of their family", so changes in the natural environment are assumed to be more important as they have a higher impact on their lives when they marry.

The age was recoded into age groupings. It was predicted to be positive reflecting the assumption that the young are at stages in their lives, where the state of the natural environment effects them, so they would have a higher degree of attention to the changes than older persons.

The predicted direction for education was negative. A higher education level was seen to make one more likely to pay attention to changes in the natural environment (thus the lower the dependent variable)

Occupational status was difficult to predict. If one has a higher status, usually, one is more removed one is from the natural environment, thus lower status would equate with higher perception of changes(lower value for dependent variable). But it could also be that the more status you have the more free time/land you have, generally the more the attention to natural environment changes.

Number of children was predicted to have a negative influence. That is the larger the number of children one has, the more constrained one can become on scarce resources thus a higher awareness of changes that occur (the lower the dependent variable value).

Agricultural occupation was another dummy variable. It is based on a recoding of the occupation variable. If the occupation was agriculturally related, it was recorded as one and it was recorded as zero, if it was not. It was predicted to have a negative influence. Those who work in the field or derive their living from the outdoors would be more aware than the others who do not. Thus the higher the value, the lower the dependent variable value.

Table C-4 and Table C-5 are a summary of the descriptive statistics used in the analysis.

Table C-4: Descriptive Statistics of Dependent Variables

Interval in which change noticed for:	Mean	Std. Deviation	n
availability of water	37.6269	28.8322	67
water cleanness at home	38.5224	28.6057	67
water cleanness in canal	24.3433	27.3665	67
soil productivity at home	49.2879	24.5155	66
soil productivity in field/orchard	39.4167	28.4201	60
air cleanness	55.0896	20.2475	67
amount of plants	24.8939	28.2675	66
kinds of plants	34.1194	29.5781	67
amount of animals	13.9701	20.8936	67
kinds of animals	25.9851	28.0970	67

Table C-5: Descriptive Statistics of Independent Variables

	Mean	Std. Deviation	N
age group	38.98	13.35	59
agriculture related occupations	.3051	.4644	59
number of children	1.51	1.45	59
Education(years)	5.07	3.38	59
moo	6.63	.49	59
marital status	.86	.35	59
occupational status	2.7458	1.2945	59
village residency grouping	35.68	19.99	59

Table C-6: Test of Multicolinearity

		VIF>1.5				Coefficient Correlations>0.5	
Dependent Variables		age group	village residency	agricultural occupation	occupational status	age group/ village residency	occupational status/ agricultural occupation
water:	availability	3.134	2.206	2.293	1.813	- 0.589	- 0.636
water quality	canal	3.134	2.243	2.293	1.813	- 0.589	- 0.636
	home	3.134	2.206	2.293	1.813	- 0.589	- 0.636
soil:	field/orchard	2.965	2.227	2.259	1.829	- 0.574	- 0.648
	home	3.178	2.216	2.293	1.810	- 0.592	- 0.636
air:		3.134	2.206	2.293	1.813	- 0.589	- 0.636
plants:	kinds	3.134	2.206	2.293	1.813	- 0.589	- 0.636
	amount	3.117	2.243	2.283	1.830	- 0.588	- 0.636
animals:	kinds	3.134	2.206	2.293	1.813	- 0.589	- 0.636
	amount	3.134	2.206	2.293	1.813	- 0.589	- 0.636

Some limitations of the data and the variables include:

- A person who has lived in the village for a smaller length of time, has only a smaller relative reference point, thus though the fact that they noticed a change is vital, the interval is irrelevant. (Solution: perhaps if filtered out those who've lived in the village for under a certain number of years, when doing the regressions, this may have been eliminated).

- Individuals had different perceptions on what change involves, in terms of degree (magnitude) and direction. Since there was no real way that the investigator could have determined how large scale the change was that they had noticed, and since people have varying degrees of what is a large scale change, it is difficult to compare the intervals against each other. For example, a person who pays attention to environmental changes, may feel that a change that occurred 20 years ago was more significant than one that occurred 5 years ago, and thus only mention the 20 year ago change. The question was not worded in a way that would suggest "most important change", but some individuals may have interpreted it that way. (Solution: may just have to accept this a true limitation.)

- Independent variables like village residency and age grouping are highly correlated (range of coefficient correlations were 0.574-0.592) , as the majority of individuals lived in the village all their life. However, for those that had not this may be important, as the time in the village and the age group would both contribute to the outcome. The differences in the results between the regressions with the index and those with the components that made up the index are an example that this was the case. (Solution: perhaps this could have been eliminated, if solution to limitation 1 was followed. Thus can use the two variables interchangeably, eliminating one from regression, and ignoring the potential differences that would arise with those who did not live in the village all their lives).

- With age, the influence may not be linear. A younger person may notice changes more recently, because they are young rather than because they are more aware than those who are older. (solution: don't know/thus just accept as a limitation, but perhaps make note of the distribution again).

In combination, these limitations suggest a degree of caution must be taken in interpreting the results. Further research would need to be done in order to increase the confidence in the findings reported.

C.3 Results from Photos for Groups 2 & 3

The following are the results for the photo sections of the Interview Schedules for groups 2 and 3. In some cases the responses have been altered grammatically. This was only to ensure that the meaning was clean

C.3.1 ***Photo E-*** *Roundup-herbicide*

Table C-7: Reaction to Photo of Roundup-herbicide

	Youth	**Women**
positive	**3**	**30**
negative	**3**	**10**

Note: A total of 6 youth and 42 women were shown this photo

Examples of comments from those who responded positively to the photo include:

- help kill weeds for a long period of time (3:1)
- saves time, weeds die fast (3:2)
- saves time and human energy (3:3)
- kills weed, easy (3:16)
- easy to use, necessity (3:20)
- helps kill grass/after spraying chemical should put up sign (3:28)
- quick, comfortable (3:31)
- could kill fast, fast effect (3:39)
- best way to kill weed (3:40)

Table C-8: Negative Issues raised with respect to the photo of Roundup-herbicide

	Youth	**Women**	**Examples**
waste disposal		1	• mess (3:6)
soil	2	2	• would poison the soil (2:1) • makes soil bad (2:10) • stays in soil (3:48)
fauna		2	• bad for the animals (3:21)
agricultural practices	3	10	• could be dangerous to use and other (2:6) • makes soil bad (2:10) • dangerous for health (3:48) • harmful to user (3:45) • dangerous for people who are in area that uses, has toxins left in the plants (3:30)
fish		1	• left over poison, not a lot of fish for eating, fish don't reproduce (3:12)
natural environment		1	• destroys environment/poison/toxins (3:29)

Other issues that were not raised but could have been include: chemical use, environmental education

The values that were portrayed through the negative responses included:

- health and safety, especially of humans, though animal health was also mentioned
- visual aesthetics

Table C-9: Solutions given to deal with Roundup-herbicide

	Women	Youth	Examples of Solutions
precautionary	7	3	• hoe weed, burn weed (2:6) • use a little, don't use (3:48) • put garbage in the right place (2:6)
reactionary	1		• need to wear protective clothing (3:47)
both precautionary and reactionary	2	1	• after spraying don't get too close/hoe down the grass is better (3:52) • should use less/if spray chemical, should put up a sign" danger" don't enter (2:2)
other	3		• there's no other substance to use (3:21) • I know it's bad, but I still do it (3:29)

Table C-10: Barriers raised with respect to the photo of Roundup-herbicide

	Youth	Women	Examples
convenience	*	*	• convenient (3:48) • faster in result, easy to use (3:52) • easy, fast, saves labour (3:71) • think this is easy way to destroy (3:80)
education/ knowledge base	*	*	• have no knowledge (3:6) • no other better way (3:17) • they don't know the method to protect (3:30)
lack of resources		*	• not enough people, therefore can't hoe it all (3:5)
control-natural		*	• too much grass (3:80)
other	*	*	• necessary to hoe down grass, if use [roundup] could kill very fast (2:2) • need cleanness (3:47)

One women responded with more than one barrier.

C.3.2 ***Photo A-*** *Dirty Canal*

Table C-11: Reaction to Photo of Dirty Canal		
Reaction	**Youth**	**Women**
Positive		**7**
Negative	**11**	**55**
Both positive and negative	**1**	**1**

Note: A total of 11 youth and 66 women were shown this photo

Table C-12: Negative Issues Raised with respect to the Photo of Dirty Canal

	Youth	**Women**	**Examples**
fear/safety issues wrt fauna		2	• poisonous animals may live there (3:21) • afraid of snakes (3:24)
waste disposal	5	19	• garbage in the canal (3:14)
canal		1	• canal is too shallow and too narrow (3:4)
stagnant water	1	3	• water won't flow good, leads to flood (3:78) • water can't flow (3:80) • makes water stay still (2:4)
weeds/grass	5	18	• a lot of weeds (3:29) • too many grasses (3:41)
water pollution	8	47	• a lot of garbage in the water, water is black (3:61) • too much water pollution (3:64)
missing		5	
listed two issues		24	
listed 3 issues		6	

The values that seem to have been raised by those who did include aesthetics in terms of both sight and smell.

Non-negative reaction includes because:

- it's usually like this(3:11)
- not a lot of garbage in canal (3:30)
- pretty (3:34, 56, 60)
- makes soil moist (3:44)
- grass helps filter the garbage when it flows (3:67)

Other issues that were not raised but could have been include:

- pollution
- responsibility

Table C-13: Solutions Given to Deal with the Dirty Canal

	Women	Youth	Examples of Solutions
precautionary	6	2	• by not throwing garbage in the water (2:8/3:71) • not littering in the water (2:9/3:74)
reactionary	37	4	• pick up garbage/ hoe down grass (2:6/3.1) • people help develop (3:71) • in dry season hoe the grass down and pickup garbage (3:53) • headman should announce, to let the people help clean up (3:2)
both	16	5	• by telling neighbour no to throw garbage in water (2:10) • help clean up, not litter (3:17) • hoe the grass, put up a sign"do not litter" (3:28)

Two individuals did not answer this question.

Table C-14: Barriers Raised with Respect to the Photo of Dirty Canal

	Youth	Women	Examples
education/ knowledge base	*	*	• don't know the consequences of it (2:2) • people don't have thoughts of environmental problems (3:9)
responsibility/ ownership	*	*	• people are careless, no one feels responsible for this (2:8) • people not helping to clean (3:3) • nobody cares (3:4) • people don't have thoughts of environmental problems (3:9) • because they're not concerned with it as a belonging (3:13) • people irresponsible and careless too (3:27) • careless, lazy (3:80)
lack of resources		*	• no place to dump garbage (3:46)
control-manmade		*	• too many people (3:23) • factory didn't purify water (3:46) • too many people (3:66) • headman didn't tell (3:71)
control-natural		*	• weeds grow fast (3:2) • because the environment helps the grass to grow faster (3:15) • natural for grass to grow(3:22)
other		*	• everyday use thus lots of garbage(3:22) • up to them (3:41)

* Issue was raised by this group

Seven women responded with more than one issue. Six did not respond at all.

C.3.3 Photo G- Dry, dumped longan leaves

Table C-15: Reaction to Photo of Dry, Dumped Longan Leaves

Reaction:	Youth	Women
Positive	**5**	**32**
Negative	**3**	**8**
Both positive and negative		**2**

Note: A total of 8 youth and 42 women were shown this photo

Examples of comments from those who responded positively to the photo include:

- can use for plants/everybody can do this, it's not like the garbage in the kitchen (2:3)
- easy to be destroyed/ make fertilizer (3:3)
- fertilizer but layer(with different organic substances), so make better fertilizer (3:6)
- fertilizer (I never burn, because it is the best fertilizer) (3:11)
- fertilizer, clean, not a mess (3:16)
- fertilizer should becomes organic fertilizer (3:18)
- good fertilizer for good soil (3:19)
- fertilizer/could be decomposed/helps prevent weeds from growing (3:22)
- good as long as not broken grass in it/good for fertilizer in the orchard (3:24)
- good soil becomes better, becomes fertilizer later on (3:34)
- could decompose/could become fertilizer (3:47)
- for health, can decompose easily (3:48)
- could become fertilizer/easy to gather and take away (3:51)

Table C-16: Issues Raised with Respect to the Photo of Dry, Dumped Longan Leaves

	Youth	Women	Examples
dangerous animals	3	1	• don't look good/is a host for poisonous animal (2:2) • many dry leaves/ snakes may live inside, dangerous for people (2:13) • mess, might have snakes (3:74)
stray dogs/chickens		1	• it's a mess, dogs and chickens will dig into it and make a mess (3:27)
aesthetics	1	9	• looks a mess (3:53) • it's a mess, not good (3:59) • dirty (3:70)

Some indicated that there were both positive and negative effects. Examples include:

- good for fertilizer, but could be home for insects and other poisonous animals (3:21)
- in the orchard it is a good fertilizer, but if it is at home, it's a mess (3:23)

Other issues that were not raised but could have been include: waste stream, environmental education

Values include:

- **health and safety, aesthetics with respect to sight**

Table C-17: Solutions Given to Deal with the Dry, Dumped Longan Leaves

	Women	Youth	Examples of Solutions
solutions listed	14	1	• should bury it, close to lumjay tree (2:2)
reactionary	8	6	• should make into organic fertilizer or burn it (2:10) • by taking in a big tank, so can decompose and use as fertilizer (2:13) • should gather and burn (3:9) • should burn it, some people gather and make fertilizer for the orchard (3:27) • should bury and make fertilizer (3:74) • burn, use as organic fertilizer (3:21)

Table C-18: Barriers raised with respect to the photo of Dry, Dumped Longan Leaves

	Youth	Women	Examples
convenience	*		• would be easier to pick it up and throw it all at once (2:2)
education/ knowledge base		*	• people don't understand to take to tank(Baw puing ma) for plants ((2:13)
responsibility/ ownership		*	• different people have different thoughts (3:9) • too lazy to burn, careless (3:21)
time		*	• don't have time to make fertilizer (3:74)
control-natural	*		• too much leaves (2:10)
other	*	*	• around orchard not around house (3:27) • probably just gathered it, won't leave it like that (3:23)
don't know		*	• I don't know why (3:26)

* Issue was raised by this group

C.3.4 ***Photo D-*** *Makeshift Common Land Dump*

Table C-19: Reaction to Photo of makeshift common land dump

	Youth	Women
positive	3	34
negative	5	11
both positive and negative		1

Note: A total of 8 youth and 46 women were shown this photo

Examples of comments from those who responded positively to the photo include:
Aesthetics:

- the vicinity will be clean after burning/want the vicinity to be clean (3:3)
- garbage won't go places by the wind, so won't be a mess (3:1)
- garbage will be all gone, won't be as messy, better than letting it blow in the water (3:12)
- if leave will be a mess/if not leave, then a mess (3:27)
- won't be a mess around the house (3:34)
- won't become dirty (3:40)
- not bad smell: because far from house (3:41)

Appropriate Location:

- gather all in one place and burn (3:8)
- good to burn or to throw garbage in a specific place (3:4)
- burn in the right place (3:7)
- burned in proper place (3:30)
- place where supposed to throw garbage (3:29)
- In the village, okay, because lots of land left to be like this (3:33)

Protect Water:

- if village is clean, water is clean (2:2)
- water would pollute if garbage goes in water (3:46)

Best Alternative:

- no place to put it, that's why we burn it (3:5)
- since won't take up land (3:14)
- best way to do it, as there is no place to throw the garbage (3:67)

Fertilizing Benefits:

- ash is good for fertilizing herbs (makes herbs grow faster and increases productivity) (3:11)
- ash can be used as fertilizer (3:23)
- can use ash for trees to grow faster and give better yield in productivity (3:53)
- mostly people do this because they don't know where else to put it, so burn like this (3:59)
- makes the soil better, ash can be used as fertilizer, helps plants to grow faster (3:60)

Other:

- burn outside village is good (3:7)
- pretty (3:56)
- good as long as no glass there (3:13)

Table C-20: Negative issues raised with respect to the photo of makeshift common land dump

	Youth	Women	Examples
aesthetics			• air smells (3:1) • doesn't look good, bad view (3:8) • if close to road not good, dirty (3:55) • dirty, don't look good (3:65) • doesn't look good, makes the village look dirty (3:25)
waste disposal	5	12	• mess, garbage left on side (3:68) • burn not in proper place (3:71) • burn all, makes it a mess (3:72)
pollution	2	1	• not good, pollutes the air (3:6) • destroys air (3:17) • garbage burned, water not clean (3:13)

Other issues that were not raised but could have been include: law of commons, environmental education

Values: aesthetics (what looks or smell good)

Table C-21: Solutions given to deal with a makeshift common land dump

	Women	Youth	Examples of Solutions
precautionary	7	3	• dig a hole in each house (2:8) • have to move burning area to the orchard or forest (3:55) • should bury to prevent animals coming and eating (3:17)
reactionary	1		• take garbage to bury (2:6) • must burn all of it, no partial burning (2:9) • separate garbage between burn and not burn (3:68) • should burn better (3:71) • burn all, if some left, bury it (3:72)
both	2	1	• burn own garbage at home not on common land, should bury better (3:66) • throw in one place, recycle (2:1)

Three women responded that they did not know.

Table C-22: Barriers raised with respect to the photo of makeshift common land dump

	Youth	Women	Examples
education/ knowledge base		*	• no better way to do it (3:17) • people don't understand the consequences of it (3:55) • no place to throw it, won't decompose, if burn it will be gone (2:1)
responsibility/ ownership	*	*	• people don't think about it/careless (2:8) • people are selfish/careless (3:66) • lazy, irresponsible (3:72) • people have different thoughts, some say that it is easy (3:68)
lack of resources	*		• no place to throw it (2:6) • nobody from the public to take garbage our of the village to right place (2:10) • no place to put it (3:65)
control-manmade	*		• still use utility goods, therefore have garbage (2:9) • too many people in the village (3:9)
don't know		*	• doesn't know why [said to ask the headman] (3:25)

* Issue was raised by this group

C.3.5 ***Photo F****-Burning Garbage*

Table C-23: Reaction to Photo of burning garbage

	Youth	Women
positive	2	21
negative	6	20
both positive and negative		2

Note: A total of 8 youth and 43 women were shown this photo.

Examples of comments from those who responded positively to the photo include:

- easiest way to destroy it (2:9)
- makes it clean, won't be a mess/destroys all trash (3:3)
- as long as not close to where people live (3:13)
- destroys the garbage, makes it clean (3:19)
- good so not a mess, no place to put garbage, less and less area, therefore must burn so it goes away (3:24)
- if burns quickly it is good (3:33)
- after burn can use the ash to make fertilizer (3:53)

- don't have that much garbage (3:57)
- so house is clean, doesn't become a mess (3:60)
- as long as fire is still on (3:65)
- all gone (3:70)

Some indicated that there were both positive and negative effects. Examples include:
- good if no rubber, plastic or skin in it, but not if there is, as it would smell (many other houses do this) (3:11)
- less mess, but air pollution (3:21)
- when burn, it won't be a mess; but if burn, it smells (2:4)

Other issues that were not raised but could have been include: environmental education

values:
- health (specifically human health)
- aesthetics in terms of both sight and smell

Table C-24: Issues raised with respect to the photo of burning garbage

		Youth	Women	Examples
flora	15	1		• it's bad for the trees near are hot, they may die (2:3)
waste disposal	24	7	22	• smells, burning plastic (2:8) • doesn't look good (3:25) • not good/smoke spreads (3:75) • smells, too much smoke (3:78) • smells, might catch other things on fire (3:66)
air pollution	131	3	7	• pollutes the air (3:55) • plastic has something that is bad for the air (3:48) • chemical spreads in air, air becomes polluted (2:10) • air polluted, dangerous for atmosphere, not safe to breath (2:11)
agriculture	27		1	• very dangerous in dry season, if in orchard, may catch on fire (3:61)
water pollution	1221	1		• burning garbage, high smoke, bad smell, bad air, after rain, can't use the water from the rain as no longer pure (2:13)

Table C-25: Solutions given to deal with burning garbage

	Women	Youth	Examples of Solutions
solutions listed	14	1	• should bury, should throw far away from home (2:2) • shouldn't burn, should gather and burn in one place (3:9) • should be buried, should be buried in one place outside the village (3:20) • bury is better, could be fertilizer later on, safer (3:23) • should be buried in back yard because it smells (3:25) • should have a hole to burn or bury (3:51) • by not burning it, bury instead (3:55) • burn within large pail (3:61) • should burn far away from home (3:74) • should make a dump hole or burn in a barrel since no place to dump (3:75)
precautionary	8	6	• dig, separate from group (2:3) • burn outside the house, separate what should be burned from what shouldn't be burned (2:8) • should dump in place or it could be reused then use it (2:10) • by recycling more (2:11) • don't burn, divide the garbage between wet and dry and dispose of in the right place (2:13) • bury is better, if dry out first then can burn, there is more smoke when the garbage is wet (3:22) • separate/divide the garbage: recycle, bury (3:48) • should be destroyed separately, make special place to burn (3:80) • start at own home by telling children, not to do that, it doesn't matter if you're rich or poor as long as your house is clean, by separating garbage (3:11) • bury organic matter/recycle plastic matter (3:21) • should built a big stove to burn (2:4) • separating the plastic out of this: don't burn the plastic as it smells and pollutes the air (3:68)

Table C-26: Barriers raised with respect to the photo of burning garbage			
	Youth	**Women**	**Examples**
convenience	*	*	• make garbage disappear (2:11) • easy (3:55)
education/ knowledge base		*	• don't know of a better way to dispose of garbage (3:64) • people are careless, they don't know, they have a low education (3:67) • people think it is easy to burn (3:68)
responsibility / ownership	*	*	• habit, easy to do (2:3) • people don't think about it/careless (2:8) • careless (3:6) • nobody from the public to take garbage our of the village to right place (2:13) • person who burns probably doesn't have a place to put it, just want it to disappear (3:20) • careless/irresponsible (3:66)
lack of resources	*	*	• there's no place to put it (2:4) • have a lot of garbage, no place to put it, so just burn it (2:2) • too many people in the village, no place to put it (3:9) • no place to dump (3:74) • don't have enough land to dump that is why burn (3:80) • no place to dump garbage, government won't collect, want garbage to disappear (3:21)
control-manmade		*	• lots of people, people generate garbage everyday, therefore too much garbage (3:22) • too many people in the village, no place to put it (3:9)
alternatives are worse, thus have to		*	• so won't become a mess, it's the way to dispose of garbage (3:16) • too much garbage, that's why have to burn (3:52) • I can't help it, if I leave it, it would become a mess (3:11)

C.3.6 Photo B-Separating Garbage

Table C-27: Reaction to Photo of Separating Garbage

	Youth	Women
positive	**8**	**47**

Note: At total of 8 youth and 47 women were shown this photo

Table C-28: Issues Raised with Respect to the Photo of Separating Garbage

	Youth	Women	Examples
separating garbage	7	34	• good to separate the garbage (3:40)
not littering		11	• throw in garbage can, not dirty, makes it look clean (2:1) • put in order so it doesn't become a mess (3:5) • gather and throw in place (3:69)
both above	1	2	• separate garbage/throw in certain place (3:14) • place where supposed to throw garbage/separate garbage (3:29)

Burn dry and bury wet

- wet can bury, dry can burn right away (3:26)
- dry bury right away/wet bury so becomes fertilizer (3:55)

Burn both: dry first and wet after drying

- dry burn right away/wet leave in sun till dry then burn (3:53)
- dry burn right away/wet bury or leave till dry then burn (3:66)

Burn wet after drying and bury dry

- if dry: organic can be burned and plastic buried (3:13)

Separate wet dry

- dry and wet garbage/easy to dispose (2:13)
- should separate the wet trash from the dry trash (3:4)
- good to separate garbage, between wet and dry. Dry won't smell, it can be thrown out earlier, therefore house won't smell (3:25)
- should separate wet and dry garbage, don't put any grass/metal in the garbage, should be separate (3:28)
- Dry garbage is easy to burn/ Wet could find other ways to destroy it (3:46)

Separate bury burn

- separate garbage/it could be separated if the garbage could burn, burn it, but if not, just dump it (2:4)
- easy to destroy if separate/plastic: reuse/burn, glass: bury (2:8)

- plastic can be burned/ organics cannot be burned, will not catch on fire (3:9)
- separate garbage, easier to burn dry, tougher to burn the wet (3:11)
- good to bury and the by-product could give to animals (3:17)

Separate/convenience

- can separate from a group of garbage/can use for plants/easy to destroy (2:3)
- should put it in a big tank and separate into groups (3:2)
- good to separate because it is easier to then destroy (3:8)
- separate garbage between that which decomposes, and that which does not (3:30)
- separate garbage, could burn dry right away (3:44)
- easy to be destroyed/some things that can be reused are reused and those that can be sold are sold (3:64)

Discussion:

- Things being "in order" kept coming up

*C.3.7 **Photo C**-Empty herbicide bottles in orchard*

Table C-29: Reaction to Photo of Empty Herbicide Bottles in Orchard

	Youth	Women
positive		**1**
negative	**6**	**41**

Note: A total of 7 youth and 43 women were shown this photo

Table C-30: Negative Issues Raised with Respect to the Photo of Empty Herbicide Bottles in Orchard

	Youth	Women	Examples
human lack of knowledge	1		• don't know the way to preserve the environment (2:7)
waste disposal	5	41	• hard to decompose and would poison the soil (2:1) • could be harmful to humans and animals, dirty mess, don't look good (2:2) • chemical could harm humans and animals (2:11) • throw garbage everywhere rather than a specific place (3:4) • not in order (3:34) • it's a mess, villagers have a problem (3:72) • danger if children play with it (3:74)

Other issues that were not raised but could have been include: disposal, toxic waste disposal, environmental education, chemical use

non-negative reaction from one women came out of the following statement: if leave it in place, it would decompose (3:44), shows an obvious misunderstanding of the ability of plastic to decompose in a reasonable amount of time.

Table C-31: Solutions Given to Deal with the Empty Herbicide Bottles in Orchard

	Women	**Youth**	**Examples of Solutions**
precautionary	7	2	• should have warning on side of container, should put it in good place (2:2) • awake peoples mind and thought (2:7) • by gathering and putting them in garbage can, so won't be a mess (3:16) • should find a better place to put it, should separate garbage (3:47)
reactionary	25	3	• gather in group and burn (2:10) • sell (3:19)
both	9	1	•
don't know	1		•

Table C-32: Barriers Raised with Respect to the Photo of Empty Herbicide Bottles in Orchard

	Youth	**Women**	**Examples**
education/ knowledge base	*	*	• don't know what's going to harm them (2:2) • lack of education (3:7) • people don't know the consequences of it (3:40) • don't know how to dispose properly (3:21) • people with less education(old people) (3:28)
responsibility/ ownership	*	*	• careless • a lot have become used, become lazy (3:80) • people have no thought (3:17)
time	*	*	• if not burn there would be too much of it (3:48) • in a hurry (3:21)
lack of resources	*	*	• no place to put it (3:21)
other	*	*	• not in order (2:7) • if not burn there would be too much of it (3:64)

* Issue was raised by this group

Note: Three women responded with more than one reason.